

PRIZE ESSAY.

AN ESSAY

ON

PLEURO-PNEUMONIA,

ITS

SYMPTOMS AND TREATMENT.

BY

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OF SURGEONS OF EDINBURGH, AND FORMERLY SURGEON-DENTIST TO HER MAJESTY,
THE LATE KING, AND HIS ROYAL HIGHNESS THE DUKE OF SUSSEX.

Motto:

"NULLIUS ADDICTUS JURARI IN VERBA MAGISTRI."—*Hor.*

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PLEURO-PNEUMONIA.

PLEURO-PNEUMONIA is a disease of comparatively recent origin. It was not heard of in England till the year 1745, when a diseased ox was said to have been imported into the country from Germany, and infected the native herds to such an extent that no less than 200,000 head of cattle are reported to have perished. Recent investigations, however, must cause this rumour to be received with suspicion, as all the experiments which have lately been made concerning the disease lead to the inference that it is not contagious ; but, like cholera, diphtheria, and other affections of late years, arises from some peculiar state of the atmosphere, or from circumstances over which man has no control.

From whatever causes it arises, it is an inflammatory state of the lungs and their lining membrane, and is marked by all the ordinary symptoms of inflammation, increased vascularity, pain, and enlargement of the structures, in the shape of weight more than of bulk. Dissection indicates the first and last of these changes ; and the second symptom is proved by a dry husky cough, similar to that of incipient consumption in the human being, and considerable signs of irritation in the larynx, bronchial tubes, and other air-passages connected with the lungs. The disease, however, has advanced to a considerable extent before these symptoms are observed, and the lungs have become more or less solid over a rather large part of their structure, or water may be deposited in no small quantity, as will be indicated by the dull sound which is heard when the side is externally struck ; if the ear be at the same time applied to the part, a crackling sound is heard at each inspiration, followed by a puffing one when expiration is performed ; the animal will be observed to breathe with difficulty, and pain is indicated by a gurgling grumbling sound ; he at the same time appears heavy, and is apt to separate from the herd ; the difficulty of respiration meanwhile increases, as is proved by his heaving flanks ; his appetite fails, and his food often remains untasted ; his

pulse is doubled in frequency, and, to escape the burning heat which is consuming him, he seeks the shelter of a tree ; his skin is dry, and its hair becomes ruffled, starting out from the surface. Should it be a milch cow which is thus affected, the milk will often be increased in quantity, but it is of a more aqueous order, and infinitely less nutrient in character. Whether male or female, the animal projects his head, but carries it low, and groans or coughs frequently. Congestion is evidently present here, as shown by the heavy protruding eye-balls, and the tears which trickle from them, forming in an encrusted state around the corners. Saliva also flows freely from the mouth, and the ordinary secretion from the nostrils is so increased that it too makes its escape in considerable quantities. The animal frequently throws itself down as if to ruminate, and generally on the side in which is the seat of the disease, but no rumination follows, and he rises again in a restless condition. At this period he will seek to drink, and he drinks with frequency and avidity, but appears to loathe all solid food. He consequently soon falls off and sinks. What is termed the "sickness" supervenes, and death quickly terminates his sufferings, which eventually assume the appearance of asphyxia, or suffocation, in consequence of the structure of the lungs having become almost wholly solid.

On examination after death, this will be found to be the case. The lungs—usually a mass of air-cells, and in the healthy animal not weighing above four pounds—have by hepatization, or the deposit of diseased substance, become one solid mass, and frequently weigh upwards of forty pounds ; variegated spots appear all over their surface—sometimes of a light, but oftener of a dark hue. The air-cells are completely obliterated, and loads of fibrin take their place. Adhesions of the same character extend from the lungs to the pleura, or their covering, and are thence continued to the interior of the ribs. There are no marks, however, of acute inflammation, and it is the left lung which is generally as well as chiefly affected.

The character of the flesh and the change that has been effected upon it by the disease will now be visible. In the early stage of the affection but small change is seen, and the animal, if slaughtered then, will not be unfit for human food ; but at later periods the meat becomes pale, soft, and flabby, of a blueish hue, and wholly destitute of the healthy red appearance which sound food presents. There can be no doubt, in this state, it is highly unhealthy, and, if swallowed, will give rise to numerous diseases, especially those of an inflammatory and carbuncular order. Boils, when severe and troublesome, almost invariably originate in this cause, and the pallid unhealthy appearance of children is to be ascribed frequently to similar circumstances. The wan condition of the poor is generally to be attributed to it ; they being partial,

or their necessities compelling them, to the eating of sausages and other prepared meat—a form of disguise frequently assumed to conceal its deleterious properties.

On the other hand, it cannot be denied that a vast deal of exaggeration has been displayed by veterinary surgeons, or parties interested in raising a false alarm concerning the disease. Because one of these gentlemen pricks his thumb while inspecting the lungs of an animal which has died from the effects of Pleuro-pneumonia, and the usual result of swelling and suppuration follows, he at once leaps to the conclusion that the malady resembles the small-pox in its nature, and that it is to be propagated as well as modified by inoculation. No conclusion is more erroneous in most respects than this. Any diseased virus will give rise to symptoms of irritation, and often of severe inflammation, if introduced into a healthy frame, as will the bite of a serpent, or the sting of a gnat. The poison inserted from the infinitesimal puncture of a diseased fly has even been recorded as fatal to life; and it is possible that the fever thus raised in the system by inoculating with the virus or diseased secretion in Pleuro-pneumonia, may avert an attack of the disease itself, in the same manner as a blister will often diminish or prevent internal inflammation; but that it has any permanent effect in extirpating the disease may as well be doubted as that inoculation with the virus, if any, of cholera or diphtheria, would give rise to the outbreak of either of these diseases. The error committed by these gentlemen in this case, arises from their confounding Pleuro-pneumonia, which is a non-contagious and internal disease, with small-pox, which is contagious and of a cutaneous order. It originates chiefly from the very imperfect knowledge of the laws of physiology and the principles of pathology—or, in other words, of their ignorance of the laws of health; as, accustomed to deal with cattle and the inferior animals solely, they can never be induced to believe that the principles which ought to guide the treatment of disease in man and in them are the same. The system of inoculation, and the various means of practising it, as well as the numerous charlatanries on the subject, may therefore be dismissed as unworthy of a moment's consideration.

But there is no satisfactory proof that the disease introduced into England in 1745 was in any degree identical with Pleuro-pneumonia, or that it differed from similar affections which have existed since the remotest days of antiquity. Silus Italicus records a malady of a similar nature which raged two hundred and twelve years before the Christian era; and Virgil minutely describes others in his *Georgics*. Both attribute it to corruption of the water, following on a protracted drought; and a like affection was equally malignant and destructive in its ravages in 1693, in the principality of Hesse, when a summer unusually hot followed

a cold and damp winter, and engendered dews of so acrid and corrosive a character, as was alleged, that they imparted a yellow hue to linen, though they probably differed but little from an ordinary London fog. Pleuro-pneumonia is thus likely to be occasioned in the warm climate of Australia, succeeding a winter unusually wet, unless the usual means of precaution be adopted with a view of protecting the animal from the debilitating effects of the latter.

Nearly twelve years previously the *Journal des Savans*, in 1682, gave an account of a similar disease, which destroyed a great number of the herds of France, where such maladies have long been treated with much greater attention than in any other country of Europe. It seemingly, however, was marked by much of the credulity or exaggerations which characterised the age, for we are told that the animals worked and ate as usual till they fell dead in an instant ; and that a violet-colored vesicle was found in other instances under the tongue, on which an eschar formed in five or six hours, and on the falling off of this the animal died. On opening the body, it was added, the intestines were found in a state of gangrene, and the tongue also, to such an extent that "it fell to pieces;" a remarkable proof of previous inattention, it may be remarked, as the disease was probably that of gloss-anthrax, or blain, mixed up with murrain.

The year 1711, however, first witnessed the establishment of a true epidemic or murrain amongst cattle, similar to what has existed to the present day. It differed, however, considerably from Pleuro-pneumonia, and was undoubtedly contagious in its character, having unquestionably been introduced by a diseased animal from Dalmatia, which was seized on or appropriated by a servant of a canon of Padua. Hence it was propagated throughout Italy, from which it extended to every adjoining part of continental Europe ; its principal symptoms being great heat and difficulty of breathing, excessive thirst and general debility. From the nose and mouth a thick mucus was discharged, and the evacuations were bloody and foetid. The appetite and the power of rumination ceased, and the body seemed shivered by various twitchings. About the fifth day pustular eruptions generally appeared on the tongue and other parts of the mouth, followed by abscesses and caries of the bones beneath. The hair also fell off, leaving the skin hard below, and the limbs or joints swelled to such an extent as to impede greatly or altogether prevent the motions of the animal, who usually died between that and the ninth day.

On opening his body, hydatids were found in the brain and lungs, discharging an odour so offensive that it could scarcely be endured, though this more probably arose from the vesicles in the process of decomposition. The ulceration was also discovered to have extended from the root of the tongue to the intestines, and

the third stomach contained a black, hard, infectious mass—the disease being so malignant, according to Laucisi, an Italian physician of the time, who investigated it, that no medicine could resist its ravages ; though setons and the actual cautery were found serviceable if timeously applied. Many other animals, he adds, were contemporaneously troubled with a similar affection, which attacked horses, hogs, deer, and domestic poultry, with equal avidity.

From Italy the disease readily found its way into France, whence it was communicated to Belgium and Holland, in the last of which 200,000 head of cattle thus perished. It extended to England too, and is supposed to have been equally destructive, though no authentic records now exist of its ravages. It began too now to assume a new aspect—that of malignant glanders ; or the alimentary canal was sometimes first attacked, and the animal was then destroyed by dysentery.

In 1731 the disease once more made its appearance, accompanied with blain of a very malignant character ; the vesicle forming with great rapidity, and generally bursting at the end of four-and-twenty hours, when the animal was either suffocated, or became the victim of ulcers which ultimately destroyed its tongue, and produced death at the end of a few days. In 1743–4 it broke out with renewed fury in France and Germany, extending thence into Holland, where it again destroyed 200,000 head of cattle, and was then once more introduced from this country into England in the following year, when it formed the true epidemic which raged there in 1745, and has been confounded with Pleuropneumonia.

A curious mode of arresting it was here adopted. The Government, in the third year of its ravages, ordered every animal to be destroyed, and compensation made to the owner, as soon as infection should show itself. Nearly 240,000 cattle were thus killed ; but it was computed that scarcely a third of them were thus diseased, the remainder being old or useless animals sacrificed to obtain the recompense ; and when at last 7,000 animals were slaughtered per month, it became necessary to suspend the order for remuneration which led to such frauds.

Still, in 1747, upwards of 40,000 head of cattle died from it in Nottinghamshire and the adjoining county of Leicester ; and, when no less than 30,000 died in the following half year in Cheshire alone, Government thought fit to appoint three medical gentlemen to inquire into its character ; one of whom, Dr. Layard, records that it generally commenced with a dry, short, husky cough, which for eight or ten days might be overlooked, until the coat began to appear unhealthy, the eyes heavy, and rumination ceased ; the animal at same time refusing both food and drink ; secreting little milk, and that of a disagreeable taste, exceedingly aqueous and evaporative, though of a deep yellow color. Many other

symptoms, however, strongly resembled those of Pleuro-pneumonia of the present day—shivering fits, succeeded by intense heat and frequent remission, difficult respiration and swelling of the throat, threatening suffocation; drooping of the head and ears, hot and slimy discharge from the tongue and mouth, great dejection and love of solitude; costiveness at first, but soon succeeded by diarrhoea and most offensive evacuations, until death terminated the animal's sufferings.

In cases where the animal recovered there were usually external swellings, on the discharge of a purulent matter from which it generally did well; though the continuation of the disease was very uncertain, the victims sometimes becoming so violent and restless that it was necessary to destroy them; but recovery was generally still more rapid, the beast appearing one day in the extremity of distress—cold mouth, sunken eyes, foetid breath, tense skin, and seemingly reduced to a skeleton—while in twenty-four hours all these symptoms would disappear, the power of rumination would return along with appetite, and the animal, if a cow, freely secrete milk of the natural color.

“On *post-mortem* examination,” says an analysis of Dr. Layard's report, “the paunch was found very much distended with food; in the second stomach there was nothing unusual; but on the third being cut into, there generally flowed from it a considerable quantity of greenish water, of a most offensive smell; the fourth stomach exhibited marks of inflammation sometimes running into gangrene, but the liver, the spleen, and the kidneys were scarcely affected. The lungs exhibited traces of the intensest inflammation; they were usually congested with blood, while purulent matter ran from every part of the bronchi.” The disease, it may be added, was undoubtedly *epidemic*, and often exceedingly capricious in its mode of attack, sometimes raging around a farmhouse or small district, and allowing there herds to escape; while on other occasions it would select the limited space, and leave the whole neighborhood free. Like the cholera, and similar affections of the present day, it evidently arose from some peculiar state of the atmosphere, though perhaps accelerated and aggravated by the filthy habits and inattention to cattle which then prevailed.

Even in those days, however, it may be added, there was no doubt entertained that the flesh of animals which had thus suffered was utterly unfit for human consumption; and the same opinion was entertained when the disease had advanced beyond the first stage. It was reserved for modern times to declare that such food might be taken with impunity, in consequence of the antiseptic powers of the stomach, and its ability, seemingly, to convert healthy and deleterious food alike into one salubrious mass; though there can be no question that the noxious qualities of the latter are thus in no degree diminished.

Inoculation, it may be added, was tried too then, and with

much the same result as at present. The animals became the subject of the disease ; and, if they survived it, might in future be exposed to it with impunity ; but the same immunity was observed in the instance of those who had been once attacked in the natural manner ; as afterwards they could be placed amongst affected cattle without the slightest danger.

It becomes a question of importance to the farmer to consider whether it is better to slaughter animals in the first stage of the disease, or to encounter the doubtful risk of their recovery ; and on mature reflection, the former seems the preferable course. If any bounty be offered by the Government, of course it is ; but this is a measure which at the present day cannot be recommended, as all such expedients are reckoned out of date ; though, if permissible in any case, they would be so in this, as the owner would have no inducement to conceal the existence of the animal, but find it his interest to get rid of it before it could contaminate the herd. Meanwhile much may be done by the establishment of such judicious commissions as that which was lately instituted to enquire into this disease, and the offer of remuneration to scientific or practical men who, as in England and France, devote their time to the elucidation of the subject.

Connected with Pleuro-pneumonia are two diseases which are apt to be confounded with it—pleurisy and ordinary pneumonia. To the former of these diseases cattle are especially subject, in consequence of the indifferent manner in which they are generally housed, and their being accustomed to pass so much of their time in rumination on cold or marshy grass. The dirty litter in which they are kept in a stall is also conducive to this ; it being too frequently the custom to spread some new fodder over the old mass, and leave a pestilential air to be thrown out by the latter. The ox is, besides, frequently exposed to wounds or contusions of the side from his horned associates ; and all these causes are apt to produce internal inflammation of the pleura.

From whatever source it arises, pleurisy in cattle may generally be easily recognized by the general shivering which it occasions, especially in the shoulders, while every other part of the animal is tranquil. It is accompanied by a cough low and short, but painful ; and breathing not so laborious as that of other chest affections, yet long in expiration, though broken and short in inspiration. The sides are also tender to the touch, and the animal shrinks if they are brought into contact with any hard substance. He lies down with pain, and never reposes on them if he can avoid it.

The pain is generally occasioned by the presence of fluid on the lungs, which renders respiration difficult ; and might easily be alleviated or altogether removed where there a means of withdrawing the serous secretion by puncture. Unhappily, however,

though this appears a very simple operation, it is invariably attended with such danger that it cannot be recommended ; and the farmer had better rely on bleeding, blistering, purging, and afterwards the administration of sedative medicines. The diet too must be reduced, and half an ounce of turpentine may be beneficially administered ; but, as the animal is much in danger of suffocation when laboring under this disease—as well as in most affections of the chest—it will generally be found more advantageous to kill him at once, especially if he be at all in condition, than await the uncertainty of recovery.

There is a species of chronic pleurisy described by M. Lecog, a professor of veterinary surgery in Lyons, which is almost identical with the disease of Pleuro-pneumonia. “Its symptoms,” he says, “are scarcely recognisable at first, and often the beast has been long ill without this being perceived. He fattens well, but, when he is slaughtered, the owner is astonished to find scarcely half the lung to be capable of discharging the function of respiration. When, however, the ox has not sufficient strength to resist the ravages of the disease, the first symptom observed is diminution or irregularity of appetite. Soon afterwards a frequent and dry cough is heard, which becomes more painful as the disease proceeds. The dorso-lumbar portion of the spine grows tender, the animal flinches when the part is pressed upon, and utters a peculiar groan or grunt, which the graziers regard as a decisive symptom of the malady. Soon after this the movements of the flank become irregular and accelerated, and the act of respiration is accompanied by a balancing-like motion of the whole body ; the sides of the chest become as tender as the loins, or more so, for the animal immediately throws himself down if pressed upon with any force ; the elbows in many subjects become more and more separated from the sides of the chest ; the pulse is smaller than natural, but not considerably increased ; the muzzle is hot and dry alternately, the animal lies down as if in a healthy state, but rumination is entirely or partially suspended ; the fæces are harder than they should be ; the urine is of its natural color and quantity ; the mouth is often dry, but the horns and ears retain their natural temperature.”

“The first stage of the disease,” he continues, “generally lasts a month or more ; and, if the animal is to recover, or at least apparently so, the symptoms gradually disappear. First of all, the appetite returns, and the beast begins to get a little flesh. The proprietor should then make haste and get rid of him, for it is very rare that the malady, though it may be palliated for a while, does not re-appear with greater intensity than before, and in most cases the disease continues its fatal course without any remission, every symptom gradually increasing in intensity. The respiration becomes more painful ; the head is more extended ;

the eyes are brilliant; every expiration is accompanied by a grunt, and by a kind of puckering of the angles of the lips; the cough becomes smaller, more suppressed, and yet more painful; the tongue protrudes from the mouth, and a frothy mucus is abundantly discharged; the breath becomes offensive; a purulent fluid of a bloody color escapes from the nostrils; diarrhœa, profuse and foetid, succeeds to the constipation; the animal becomes rapidly weaker; he is a complete skeleton, and at length he dies."

The *post-mortem* examination is interesting. "Examination," says the same author, "after death discovers slight traces of inflammation in the intestines, discoloration of the liver, and a hard dry substance present in the manyplus. The lungs adhere to the sides and to the diaphragm by numerous bands, evidently old and very firm. The substance of the lungs often presents a reddish-grey hepatization throughout almost its whole extent. At other times there are tubercles in every state of hardness, and in that of suppuration. The portion of the lung that is not hepatized is red, and gorged with blood. Besides the old adhesions, there are numerous ones of recent date. The -pluera is not reddened, but by its thickness in some points, its adhesions in others, and the effusion of a serous fluid, it proves how much and how long it has participated in an inflammatory action. The trachea and the bronchi are slightly red, and the right side of the heart is gorged with blood."

M. Lecog attributes this disease to the circumstances of cattle being over worked, driven too far and with undue rapidity, especially in bad weather, when they are frequently half starved on the journey, or compelled to put up with unhealthy and innutritious food. For treatment, he recommends that mild and nourishing diet, especially greenm̄eat, should be substituted, and mucilaginous drinks, made of oatmeal or linseed, administered. Bleeding he rarely resorts to, and but little at a time, even should the state of the pulse point out the necessity for the operation, which he recommends should be done repeatedly, the blood being thus abstracted in small quantities. But he places his chief reliance on setons, injections, friction, and warmth; though, before resorting to any of these curative means, he requests the owner to consider whether it is not better at once to kill the animal; as, however skilful the treatment, it was rare that a beast was saved, two only out of thirty recovering under his care, and one of these dying shortly afterwards.

Pneumonia, or pure inflammation of the lungs, is of comparatively rare occurrence, as these organs are seldom affected exclusively. On the other hand it was formerly considered the most frequent of all, every disease of the chest being classed under this head. All cattle are, however, more or less subject, especially after they have been over-driven, or hurried along a journey too

rapidly. In a few hours afterwards the disease generally appears under the symptom of deep, heavy breathing, a cough painful but intermitted, great inability to move, in consequence of tenderness of the sides, much heat of the mouth, while the ears, feet, and horns are extremely cold ; dullness of aspect, and extension or drooping of the head, with heaviness of the flanks, and an apparent dread of suffocation. Bleeding in these cases should be resorted to, and kept up until the pulse gives indications of faltering. Purgatives of an unirritating kind should follow, especially epsom salts and sulphur. Blisters may at the same time be applied, or blistering ointment, and a mixture of turpentine with the tincture of cantharides rubbed over the skin ; or boiling water and cauterizing irons in the hands of the veterinary surgeon, with setons in the dewlaps.

When the disease is more acute, or it assumes the aspect of an epidemic, all the symptoms are more severe. The animal drops his head, and exhibits great heat in the mouth and breath, with dryness of the muzzle ; his appetite is lost, but thirst is great ; cough frequent, hard, and dry, accompanied with great agitation of the flanks ; his horns and ears are hot, or by turns hot and cold ; coat rough, and an appearance of lameness in one or both of the hind legs ; there is great heaviness in him, and seeming prostration of strength ; and his evacuations are black and solid, though occasionally liquid, black, and most offensive in their odour.

If these symptoms—the primary ones of the disease—be neglected, others worse soon follow. The beast stretches out his head, and grinds his teeth ; his eyes become preternaturally bright, yet suffused ; mouth and breath hotter, while a mucus or purulent fluid is discharged from the mouth and nostrils, which eventually thickens and grows bloody, red, or brown ; his cough has increased in severity, and it now appears convulsive, accompanied with violent heavings of the flanks, and spasmodic dilation and contraction of the nostrils ; sweats break out in various parts of the body, but the secretion of the milk is suspended ; the teats consequently become hard and swollen, and the udder is in like manner affected ; tumours make their appearance on various parts, of an order so painful that the animal can no longer lie down, or, if he does, he starts up almost immediately, evidently suffering extreme pain ; shivering fits succeed, though the temperature of the body varies strangely, and at night an exacerbation supervenes, which generally lasts till morning ; debility then increases, and the flanks heave violently, the back and loins bend, and the belly is drawn up or corded, while the limbs are convulsively collected together ; their sensibility has now diminished, or has seemingly entirely gone, and the excrements become liquid and foetid, accompanied with much straining or

tenesmus; the respiration increases in frequency and labor, the breathing now becoming stertorous, with a loud gurgling noise in the thorax, great dilatation of the nostrils, and the discharge from them of a most offensive fluid; a foetid secretion also flows from the dilated eyeballs, and ultimately blinds the animal, whose strength rapidly falls off until he staggers, falls, and dies, generally in from twenty-four to forty-eight hours if he be young and vigorous, though he may linger six or seven days if old or out of condition.

A *post-mortem* examination indicates, that the lungs have been the seat of violent inflammation; they being now gorged with dark-coloured blood, mixed, however, occasionally with pus, and patches of hepatization; their substance is disorganized, softened, and easily torn, evincing gangrene too, chiefly in front, which appears to have extended its ravages also to the pleura, pericardium, and diaphragm; the intestines appear inflamed, but not in a high degree; the liver is enlarged, and yellow in its aspect, while the bile is thickened, the rumen filled with a mass of dry indigested food, the manyplus containing a substance hard and easily broken, and the fourth stomach evincing marks of inflammation.

This disease is so violent in its character that the treatment must be equally vigorous. Bleeding should, in the first instance, be resorted to, and persevered in till the faltering condition of the pulse indicates that sufficient blood has been abstracted. Afterwards, purgatives should be administered—epsom salts, or two scruples of the farina of croton, if it be considered essential that the medicine should operate quickly. Tartar emetic, digitalis, and nitre, should also be given if the inflammation continues violent, when half an ounce of nitrous ether may frequently be administered with advantage. Sedatives may follow, in the shape of half an ounce of laudanum, mixed with gentian, ginger or colombo, in half a pint of good ale, when it is considered that tonics are also required.

The animal, if he recovers, should, if possible, be removed to a salt marsh, or at least have salt largely given to him in his food. He may also be advantageously treated with mashes of malt, or carrots, clover, and hay. So soon as the disease makes its appearance, every sound animal in the herd should be bled and purged—a far more satisfactory way of averting it than inoculation—as the disease, being epidemic in its character, is not then necessarily brought on, as it is sure to be in the other instance, and there is yet no satisfactory proof of its contagiousness; the circumstance of its appearing in numerous herds of cattle at the same time being merely owing to their exposure to the same atmospheric influence.

Several other diseases are apt to be confounded with pneu-

monia—especially bronchitis, or inflammation of the bronchial tubes extending to the air-passages and cells. This affection—which is of an intermediate nature between catarrh, or ordinary cold, and consumption, or phthisis pulmonalis, to both of which allusions will afterwards be made—is usually first indicated by a gradual change of countenance in the animal, and his assumption of a haggard anxious look. His respiration becomes rapid and laborious, attended by a husky and wheezing cough, and the secretion of a thick mucus, by which the air-passages are blocked up. The animal evidently breathes with difficulty, and he shows a great disinclination to rise, as well as a tendency to suffocation, in which the malady too often terminates. The slightest motion aggravates his suffering, and causes him to cough with renewed severity; but the seat of the disease is so general and so deep that no pain is indicated in any particular part. Notwithstanding this, however, the affection proceeds with not the less rapidity, and speedily reduces him to the condition of a skeleton. When he dies at last—which he frequently does in the course of a few days—the bronchial passages are often found blocked up with worms, though how these animals entered—whether in a paranticle shape, or were generated in the interior—is as yet not satisfactorily known. The disease is especially apt to attack young cattle, and it has committed great ravages in every country where it has made its appearance; being confined to no particular latitude, but equally common in Norway, Britain and the West India Islands. On dissection, the lining membrane of the windpipe, as well as bronchial tubes, is found to be highly inflamed and partially disorganized, studded with a number of spots strongly resembling herring-roë or the spawn of a fish.

In the treatment of bronchitis, bleeding is the first remedy that should be relied on. Purgatives should then be administered, and, if the animal be young, or the presence of worms suspected, vermifuge medicines, such as turpentine, should be given. Diluted chlorine gas might also be inhaled, and the stall or stable should be sprinkled with chloride of lime—a cheap remedy which might be tried in many cases of pneumonia. When the turpentine has had its effect, mashes and the usual sedative medicine should be given; or, if it fails, recourse may be had to squills, gum benzoin, and the balsams of Peru and Tolu. Care, however, must be taken that the medicines are not too heterogeneously mixed up in a mass, lest they counteract or neutralize each other.

Several more circumscribed affections are apt to be taken for bronchitis or even pneumonia—such as laryngitis or inflammation of the windpipe, and pharyngitis, or a similar condition of the gullet. The former of these maladies is a very formidable disease, and generally terminates fatally with great rapidity, unless tracheotomy, or the operation of puncturing the windpipe,

be performed ; but fortunately it is of comparatively rare occurrence. It is usually brought on by exposure to cold and wet, especially marshy ground ; and must be promptly met by bleeding, blistering, purging, and if extreme, by performance of the operation, otherwise suffocation will follow. The operation is performed by casting the animal and securing him, when the operator, taking the edge of the atlas, or first bone of the neck, for his guide, should make an incision about three inches in length along it, and then, dissecting the muscles carefully aside, cut out a small portion from two tubes of the larynx. The operation generally affords immediate relief, but should never be attempted except by an experienced veterinary surgeon. Occasionally a tube may be worn, if duly secured by means of a projecting edge and ligatures after being introduced, for a few days after the inflammation shall have subsided in the larynx ; and cases have been known where it was permanently left here, when the upper part of the windpipe had been closed by the violence of the inflammation. In these cases, however, it is better to destroy the animal at once, unless he be a favorite or of an advantageous breed.

Pharyngitis is an affection of the gullet, in all respects similar to the preceding ; is marked by similar symptoms, and is to be treated in a similar manner ; with the exception, that it is the upper part of the pharynx, not the larynx, which is to be the subject of operation.

These affections are usually local, though they sometimes give rise to much constitutional irritation, and are often of a dangerous character. Catarrh, or common cold—known also by the name of hoose—is of a more general order, and may give rise to more serious diseases. It usually arises in the beginning of spring, or towards the end of autumn, and is most apt to attack young animals, or cows after calving, and, though often disregarded by the farmer, or considered as trifling, it is frequently the forerunner of such fatal diseases as phthisis pulmonalis, or consumption of the lungs, and like affections. Sometimes cold or humidity may have produced it, but often it is occasioned by deficiency of ventilation, the cow-house being so crowded that its temperature is raised far above that of the external air, and the hoose being then caught by the animal on passing from one to the other. Still, however, it passes unheeded by the farmer or the cowherd, and the animal is thus permitted to remain week after week unattended to, unless the falling of his condition, or diminution of milk if a female, seriously attracts attention, but not in all probability until the foundation of pulmonary consumption has been firmly established ; whereas a little timely bleeding, followed by a dose of epsom salts and half an ounce of ginger, might promptly have restored the beast to health.

There is a species of epidemic catarrh, resembling influenza in

man, which is much more virulent. In addition to the usual symptoms of a cold, it is attended by costiveness so obstinate that almost no medicine, except croton oil, will counteract it; and then a diarrhœa equally obstinate supervenes. Tumours at the same time appear about the neck, head, ears, and loins, accompanied by a crackling sound of the skin when pressed upon, in consequence seemingly of the formation of air beneath the integument. The intestinal canal is next affected, and its discharges become offensive in the highest degree. The animal at the same time loses its appetite and strength; becomes unable or unwilling to move; a foetid discharge, like that of glanders, soon follows from its mouth and nostrils, and this is usually a fatal symptom, as he falls, and dies shortly afterwards.

Bleeding is the only mode by which the disease can be arrested, and it must be freely resorted to at the outset while the inflammation is intense, but discontinued so soon as reaction and debility follow. Aperients, such as sulphate of magnesia, should then be administered; or, if the fever be severe, nitre and tartar emetic. Digitalis, laudanum, and nitrous ether may afterwards be given, with mashes and green food, on the recovery of the animal. He should then, as soon as possible, be turned for a few hours a day into some adjacent pasture; or the cow-house should be kept well ventilated, though warm, if he be kept within doors.

Neglected colds, whether in man or in the inferior animals, are exceedingly apt to degenerate in phthisis pulmonalis, or pulmonary consumption, one of the most fatal diseases with which the human race or any species of quadrupeds can be afflicted, though not necessarily deadly in either, for in both it can be arrested if the remedial means are timeously applied. When, however, inflammation has proceeded to a certain extent, tubercles, or small indurated bodies are formed in the lungs; and these at last softening and suppurating, gradually extend their ravages until the whole of the substance of the respiratory organ is consumed.

A cough of a peculiar nature is the first indication of the disease. It is low and feeble in its tone, instead of being loud and sonorous, of a sound difficult to be described, but which can never fail to be recognised by those who have heard it, and strongly resembles what is commonly called "a churchyard cough" in the human subject. This is a sign that inflammation has commenced in the interior, and a slight bleeding, accompanied by purging and mashes, as well as the insertion of a seton, will often at this period arrest it; if neglected however, the cough rapidly assumes a gurgling, rattling sound; and this is a sure criterion that the disease is making rapid progress beneath. The second stage of the malady now comes on, indicated by many of the symptoms which marks the latter stages of pleurisy or pneumonia—diminution of milk in the instances of females, and deterioration of its quality;

loss of flesh and difficulty of rumination, though the appetite continues undiminished ; diarrhœa, and the discharge from the mouth and nostrils of a thin, colorless, and at first inoffensive fluid, but which eventually becomes thick, purulent, fœtid, and bloody. The skin now becomes tender, dry, and scaly, emitting a crackling sound when the animal is touched, or as she staggers along. The last stage of the disease now supervenes ; utterly exhausted, the animal falls and dies, when, on inspection of his lungs, it will be found that they have almost wholly disappeared, and been replaced by a mass of tuberculated, hepatized, or purulent matter.

In the early stage of consumption, it is undoubtedly more conducive to the interest of the owner to get rid of the animal at once, as it then shows a disposition to fatten rather than fall off, and can generally be disposed of to advantage. Should he resolve on retaining it however, resource must be had to bleeding, purgatives, and the remedial means already mentioned ; but, above all, attention must be paid to the proper ventilation of the cow-house, and the avoidance of heated air ; for a cool atmosphere is more favorable than a warm to the arrest of the disease.

Consumption however is usually slow, though, like Pleuro-pneumonia, ultimately certain in its fatal results. But death may not occur till twelve months fully have elapsed since the first appearance of the malady ; and the affection of the lungs may exist to an almost incredible extent without ever being suspected ; butchers frequently being surprised to find these organs almost wholly gone on slaying animals which seemed to be healthy, fat, and otherwise in good condition.

There is therefore in none of these diseases a combination of all the symptoms as they usually appear in cases of the affection now known as Pleuro-pneumonia ; unless it be in circumstances that this malady, like most of them, is most readily developed by a humid atmosphere and careless system of herding, but it is arrested by a dry air and attention on the part of the stock-owner. The inflammation and fever which attend it are also more of a subdued and sinking kind, rarely attended by any prominent symptoms which indicate their existence in the other, though ultimately terminating in a sort of typhoid type, under which the animal assuredly succumbs. The denseness of the hide perhaps prevents the development of the disease externally, as in these, in consequence of the milder state of inflammation which prevails, and the loose structure of the lungs, which in cattle is perhaps greater than in any other quadruped, affords more facilities for the formation of those extensive adhesions which are so characteristic of it. The milder atmosphere of Australia has possibly likewise modified the disease ; though it may promote the formation of that fibrin which is here found to be deposited more rapidly and to a greater extent than in any other clime ; but there seems no

reason whatever for the opinion maintained by some Australian veterinary surgeons, that the disease arises from the absorption of a specific animal poison, which may remain dormant in the system for twelve months before it eventually shows itself.

All nature and analogy are contrary to this opinion. The blood circulates throughout the whole frame in the course of a few minutes, and conveys an active poison in that short period to the centre of the vital system, where it proves fatal, from the most distant extremity. Even in the instance of small-pox, where the virus is so subtle that it is wafted on the air, there is no instance of its remaining undeveloped even for a month—the shortest period which those who contend for the contagious nature of Pleuro-pneumonia assign for the appearance of the malady after infection. The climate of Australia is, moreover, unfavorable to the development of contagious diseases, and hence such maladies as glanders are comparatively unknown.

For the benefit, however, of those who believe in the contagiousness of Pleuro-pneumonia, and that it can be modified if not altogether extirpated by inoculation, the mode of performing the operation may be briefly described. Great importance is attached by the professors of the art to the acquisition of an adequate or potent virus, and equal care must be bestowed on its preservation when got. According to them, it is most readily obtained from the lung of an affected animal, and must be carefully preserved in glycerine after it has been obtained. The saliva, the synovial secretion of the joints, the serum of the blood, the pericardial effusion, even the urine have been tried in vain. Nought will suffice except the liquid from the lung of an animal recently slaughtered, evaporated to the extent of one-half through animal charcoal and sand in the heat of the sun, when, in the absence of glycerine, it may be preserved for weeks in strong syrup of crystallized sugar, though the former medium will preserve it for months, or even for years.

This inestimable fluid, when got, is to be inserted on a dorsel of lint in a transverse section of the extremity of the tail, after first carefully removing the whole of the hair, and wiping away the blood which might interfere with its operation by washing it away. There are other modes of applying it, such as by scarification, as in the human subject when inoculating for small-pox, on the forearm, behind the ears, on the rump, ribs, dewlap, &c. ; but the plan first mentioned is considered the preferable, and is warranted to act in from two to twelve weeks. Occasionally indeed it operates much sooner, and produces extensive sloughing which, extending to the peritoneum and organs adjoining, leads to death within a period much less than the latter. If performed on an animal in the advanced stage of the disease, it must be done also to a much greater extent, and the virus administered in a

much larger dose ; three incisions over the ribs on each side, and as many dorsels of lint well soaked in the poison, in this case being necessary.

It must be evident to any one who reflects on these facts, that the inoculation thus performed, can in no degree affect Pleuro-pneumonia ; though a new irritation may be set up in the system, which, like that produced by blistering, &c., may counteract the lesser one reigning within. Great benefit may, however, result even from the erroneous belief that Pleuro-pneumonia is contagious, as the cattle-owner will thus be induced to pay more attention to cleanliness, and thus avert epidemics, which, like the cholera, the plague, and similar scourges of the human race, probably owe their origin to filth. No instance, however, is known of pulmonary diseases being propagated in the human subject by contagion. Even in cases of consumption, when various members of a family are successively cut off, this is to be attributed to hereditary tendency, and exposure to the same exciting causes, instead of infection, or coming in contact with each other ; and, reasoning by analogy, the same remark will be found to hold good in the instance of cattle and other classes of *mammalia*. Farmers and stock breeders may therefore sleep in security, without apprehension of their herds being decimated or destroyed by this disease ; though when it breaks out in any of their number, common prudence and humanity dictate the expediency of segregating it from the others until a cure be effected, or the result known.

Another objection to inoculation is, that the matter or virus is often of a putrid order, and, when introduced into the system, thus gives rise to diseases worse than Pleuro-pneumonia itself. Sufficient attention is not paid to the fact, that the latter is an affection of a febrile order, and that it frequently follows upon many other maladies, such as those produced by abscesses, hydatids, derangements of the liver and digestive organs, and the presence of foreign bodies in the œsophagus, the various stomachs, and other parts of the animal. Inflammation of the lungs and pleura may follow any of these causes. There seems no reason, therefore, why inoculation, instead of being encouraged, should not be put down by act of Parliament. This, however, is a subject in which every stock-owner may be allowed to consult his own interest or inclination, so long as his choice does not interfere with the interests of others.

When one considers the delicate tissue of the respiratory organs, it is surprising they are not oftner the subject of accident or disease ; a small cartilage, the epiglottis, alone saves the animal from suffocation at every act of deglutition ; and, though it is larger in the ox than in the horse, the hasty manner in which the former at first swallows his food, renders him more liable to

accidents of this nature. Foreign bodies are also more frequently lodged in his throat, from the avidity with which he eats, and from the circumstance of his food—such as turnips, &c., not being cut up for him, as in the instance of the horse, but left for him to devour entire, or in large masses, which are often entangled in the gullet. Suffocation or death is apt to follow these, unless they are immediately averted by the operation of the probang or by excision, and even when they are thus obviated, fatal consequences may ensue from inflammation of the lungs they engender. Foreign bodies also find their way into the chest and other parts of the animal in a manner altogether extraordinary. Scissors and knives have been discharged through the sides, after many days of suffering ; but not until they had excited symptoms strongly resembling attacks of Pleuro-pneumonia.

Fevers too may often be confounded with inflammation of the lungs. An animal is suddenly observed to be drooping and dull, with dry muzzle, loss of strength and appetite, cessation of the power of rumination or even eating, quickening and hardness of the pulse, hotness of the horns, and heaving of the flanks. To the inexperienced this may seem an attack of the respiratory, but it is really one of the vesicular organs ; and it is nothing more than a slight fever, which readily yields to a mash and dose of medicine. If neglected, however, the symptoms will increase, and ultimately assume all the appearance of pleurisy ; eventually indeed, if bleeding be neglected, the inflammation, from being general, may concentrate itself on some particular organ ; frequently the lungs, though sometimes also the stomach or intestinal canal, and thus give rise to all the symptoms of pneumonia too.

Fever may be either of an inflammatory or acute, or typhoid and of a slow and chronic order. The former especially attacks all young cattle, and is known by all the various names of blood-stroke, effusion of blood, joint-murrain, black-quarter, and quarter-evil. Thousands of cattle are annually attacked by these maladies, and thousands perish. The disease is generally induced by overfeeding on some luxuriant pasture ; but it may be epidemic too, and run throughout a certain district. It frequently makes its appearance without any premonitory warning ; the first symptom being that the animal is observed to raise his head and extend it, as well as his neck, in a horizontal position ; protrudes his eyes, which are blood-shot, and his muzzle, which is dry ; expand his nostrils, which, with the breath, and roots of the horns, are hot ; and heave his flanks with violence. He groans and moans in a subdued and peculiar way, and his respiration is quick and laborious ; while the pulse, ranging from 65 to 70, is hard and full. Rumination at same time ceases, and the appetite is gone. Sometimes he appears conscious of his position ; at other occasions he stands unmoved for an hour, seemingly heedless of all

external objects. If he attempts to change his position, frequently he staggers and falls ; but rises, or endeavours to rise again immediately, until he is finally compelled to yield to debility, when he becomes finally prostrate and insensible ; dying in from twelve to twenty-four hours after attack. In the few cases in which he recovers, either by medical treatment or the power of nature, his legs generally continue for a long time feeble. Hence he has an appearance of lameness, which causes the malady to be named "joint-murrain" or "quarter-evil."

But in the great majority of instances this partial recovery is only the precursor of a relapse. The animal soon becomes exceedingly sensitive, exhibiting great tenderness in the back and loins ; which, with his shoulders, now also swell, emitting a peculiar crackling noise, as if gas were being generated beneath. Disorganisation now rapidly takes places, and the skin assumes a scurvy, hard, deadened appearance. It drops off in patches, sometimes seemingly in consequence of dry gangrene ; but more frequently it sloughs off in dark-colored masses, which give rise to the name of "black-quarter," a result which is almost certain to be fatal ; for wide-spreading ulcers now appear about the quarters, teats, and belly, mouth, and tongue, accompanied by the discharge of a most offensive fluid from the nostrils. The urine and evacuations now also exhibit marks of inflammation, being high-colored, bloody, and most offensive. In this condition the animal generally sinks, in two or three days, a mass of putridity ; though instances have been known where, by means of careful nursing and dressing of the ulcers, he has recovered, even under circumstances so extreme.

On examination of the body after death, almost all the organs are found to be in a state of congestion. The pleura, the lungs are so to such an extent that they would appear to have been the principal seat of disease ; and hence even now the malady may be considered to have been a complicated case of pneumonia. But the same indications are observed in the peritoneum, or lining membrane outside of the intestines, and mucous membrane which covers their interior. Traces of inflammation and ulceration are found in the colon, and the venous system is so congested that the vessels seem extended almost to bursting. The stomach too is inflamed, and the substance of the liver destroyed. Vomicæ, or large openings, are found in the lungs, and even the brain is affected by the mass of congested vessels which press upon it. The heart alone remains comparatively uninjured ; but it is surrounded by effusion. Every part of the cellular membrane is also gangrenous, and the hideous smell indicates that the whole body has become decomposed.

Inflammatory fever usually sets in so suddenly, and pursues its course so rapidly, that there is generally no time for having

recourse to the butcher, even if the butcher would buy. The stock-owner must therefore at once have recourse to blood-letting, and that on the most extensive scale, until the animal staggers or threatens to fall. No other means will avert that tendency to universal congestion which at so early a stage introduces coma and insensibility; and purging must rapidly follow on bleeding; a pound and a half of epsom salts, dissolved in water or gruel, being poured immediately, though carefully, down the throat of the animal, adding another pound if the dose should not have operated in the course of six hours, and half a pound every other six hours until the bowels are freely opened. If the pulse then be again hard and quick, he must be bled a second time. Setons must be at same time inserted in the dewlaps, and a drachm of tartar emetic, a drachm and a half of digitalis, with half an ounce of nitre, should be administered three times a day. This treatment will sometimes be found effective, even when the second stage of the disease has set in; but aromatics—such as gentian, ginger, and colombo—must now be given also if there be much debility.

In the last stage of the disease, however, if the veterinary surgeon has not been called in till the sloughing process has commenced, no bleeding must be had recourse to, as the constitution is too weak to sustain it. He may still, indeed, administer a purgative, or, if it has not previously been done, a few injections; but the aromatics must now be given in double quantities, mixed even with a pint of good ale, to sustain the system. The ulcers should also be carefully washed, several times a day, with a solution of chloride of lime, and the joints rubbed with equal parts of hartshorn, turpentine, and spirits of camphor, while the enlargements about the hock, knee, and elbow are fomented with hot water. Tonics, mashies, and substantial gruel should at the same time be given to the animal, or forced into him with the stomach pump if he refuses to swallow. The stench is to be subdued by redoubling, if need be, the quantity of chloride of lime in the solution before applying it to the ulcers; and so soon as these indicate a disposition to heal, they may be dressed with the ordinary ointment or the tincture of aloes; the animal, so soon as he begins to eat, being turned into some adjoining field, the grass of which is short. He should still, however, be carefully examined each day, and a little blood abstracted, or slight purgatives administered, if there be any tendency to the recurrence of the inflammation indicated by heaving of the sides or redness of the eyes.

“But,” says Mr. Lawrence, an able writer on the subject, “prevention of this malady is the only cure worth notice, because, after the attack, the very nature of the case renders all remedy either uncertain or of very little profit, if even successful, on account of the loss of time and money. A piece of short and

inferior keep should be reserved as a *digesting place*, into which the cattle may occasionally be turned to empty and exercise themselves. Those observed to advance very fast may be bled monthly for several months, of the efficacy of which practice I have, however, by no means so good an opinion as that of giving medicines which prevent internal obstruction. I am well aware of the difficulty of such measures with a number of cattle in the field ; but I am convinced that occasional purges, with alterative medicines, would prevent those diseases which seem to take their rise in over repletion and accumulation."

Typhoid fever is of a different order, being slow and chronic. It is more apt to attack full grown and aged cattle,; but also very often proves highly fatal among the younger animals and weaning calves. Sometimes it originates of itself, on other occasions it is but the second stage of the disease just described. It has no peculiar symptoms, except a gradual but rapid sinking of the system, loss of appetite and flesh, disinclination to move, diminution or suspension of the ruminating power, and dullness on the part of the animal generally. Diarrhœa, often obstinate, succeeds in the later stages, accompanied by fœtid or bloody discharges. At other times it is attended with dysentery, when the animal rapidly sinks. Usually, however, five or six weeks elapse before it assumes this fatal aspect ; and it is observed to be most severe, as well as prevalent in the spring and fall of the year. It is usually of such a slow order that it may frequently be confounded with Pleuro-pneumonia ; and by the best authorities is not considered infectious in its character, though, all the cattle being exposed to the same exciting causes—cold and wet, with rank grass and decomposing herbs—it often becomes an epidemic equally active and fatal in its ravages.

Slight purgatives, such as epsom salts with aromatic medicines, are the remedies requisite for this disease ; but if the pulse, by its hardness and frequency, indicates the existence of febrile irritation, bleeding must be resorted to, though with caution. Tartar emetic, digitalis, and nitre, will appropriately follow, but no tonics should be administered while the horns and mouth are hot. The great means of cure however, or rather of prevention, is to remove the animal from the moist and acrid or decaying to a dry and well cropped pasture ; as humidity, with the deleterious gases evolved from marshy ground, is the main cause of the malady.

Gloss-anthrax is a local disease, some of the symptoms of which have occasionally been mistaken for those of Pleuro-pneumonia. It is an affection of the tongue, arising seemingly from some derangement in the condition of the saliva or salivary glands. It is of an inflammatory order, and advances with tremendous rapidity ; that organ being swollen apparently to twice its ordinary dimensions, and the whole of its sides converted into a mass of

vesicles in the course of a few hours. But it is the glands beneath which are the real subjects of enlargement, and the tongue is only secondarily affected by being pushed out of its position. Still, the effects of the evil are the same ; and, the air passages being thus obstructed, the animal breathes with difficulty and is frequently suffocated. M. Thirtrel d'Arbaval, author of a French dictionary of veterinary medicine and surgery, who has written ably on this and many kindred affections, records many cases of its fatality as an epidemic ; the animal generally dying at the end of twenty-four hours, during the latter part of which the saliva, which at first was profuse but limped and inodorous in its flow, becomes purulent, bloody, and fetid in the highest degree ; the head and neck of the victim at same time becoming enormously enlarged.

The disease, which is also known by the name of "blain," is often followed by a malignant or typhoid fever, when it does not prove fatal within this short period ; and the inflammation is sometimes so extensive that the tongue mortifies so completely that large portions of it may be cut away without the slightest sensibility on the part of the animal. This inflammation may also extend over the œsophagus, or gullet, to the first and fourth stomach, and be thence continued to the small intestines, and even the cœcum and rectum. Its origin is unknown ; but it is formed chiefly on low marshy grounds, and in cattle which have previously been in indifferent condition, both of which causes probably contribute to it, as it is observed to diminish on their removal to higher and better pasture.

From whatever causes it arises, there is little doubt that this is a contagious disease, and that, like glanders in the horse, it is also communicable to the human frame. The French author already quoted, records that at Nismes, in 1731, it was communicated not only to men but to every species of domestic animals, and instances have been since adduced of its having proved not less destructive to individuals than glanders ; though, unlike this, it is not conveyed by the breath, but requires actual touch. Especial care must therefore be taken, while handling an animal labouring under this affection, that none of the saliva be allowed to come in contact with any sore or scratch upon the hand, as serious consequences might thus ensue ; though a little lunar caustic, if promptly applied lightly over the part, will not fail to avert them.

The treatment of this disease, for an affection so formidable, is comparatively simple. It consists merely in freely opening the vesicles with a lancet throughout their whole extent ; and if this be done so soon as the saliva is observed profusely to flow, and the vesicle to make its appearance, the malady will be subdued as promptly as it arose. Puncturing, however, or merely partial opening of the vesicle, will not suffice ; and if the disease be far advanced, it will be necessary to wash the ulcers with a solution

of chloride of lime, in the proportion of a drachm to the pint of water. In cases of great severity, fever of a low typhoid order may follow, and must be treated in the usual way. When the mouth begins to heal, and all traces of fever have disappeared, a mixture of equal parts of tincture of myrrh and water applied to the seat of disease will accelerate a cure.

Thrush in the mouth may be sometimes confounded with this formidable disease, but it is in reality a very trivial affection; though veterinary surgeons often take, or receive, much unmerited credit for their successful treatment of it, under the supposition that it was "blain." It is merely a slight inflammatory outburst which appears all over the mouth, and even on the lips, in the shape of small pustules, or occasionally vesicles, as well as over the sides and body of the tongue; and is to be treated in the usual way for such affections—namely, the exhibition of a small dose of medicine; after which the animal will generally be better than ever.

Inflammation of the parotid gland—a very common affection in cattle—may occasionally in the first instance be taken for either of the foregoing diseases. It is generally an accompaniment of hoose, but frequently results from contusion or accidents. It is generally denoted by the heat of the parts and swelling of the neck, as well as indisposing the animal to eat and ruminate. Sometimes it is so severe as to threaten suffocation, and hence has been named strangallia; and usually yields readily to fomentation and a slight abstraction of blood. But if it leads to suppuration, and abscesses be formed, the case may be more serious; and these will require to be freely opened with a lancet, otherwise, if allowed voluntarily to open, they may degenerate into ulcers which may lay bare the whole of the important blood vessels and other vital parts of the neck, and be very difficult to heal. Blisters may occasionally be applied if the internal inflammation be severe and there is no tendency to suppuration, and the chloride of lime solution, or tincture of aloes employed to dress the part, if there be any appearance of gangrene. Slight doses of epsom salts, accompanied with aromatics, will at same time be found beneficial.

The submaxillary glands, the sublingual, and the soft palate, are all liable to similar attacks of inflammation, and may interrupt the breathing to such an extent as to be mistaken for either pleurisy or pneumonia. The symptoms so much resemble the preceding that they need not be detailed; and their treatment is in all respects analogous. A slight affection of the like nature is named the "barbs" or "paps," in consequence of the appearance of small red projections in the lining membrane of the mouth. These the ordinary cow-leech is fond of removing by the scissors or the cauterizing-irons; but a dose of cooling medicine will be found safer and more efficient. In investigating these diseases of

the mouth and throat, especially in the instance of foreign bodies in the gullet, the utmost care must be taken that none of the important blood-vessels be wounded, or the œsophagus itself torn by the violent use of a coarse probang; otherwise hæmorrhage, or infiltration might follow to such an extent that the result would be fatal.

Of the constitutional diseases which may be confounded with Pleuro-pneumonia, enteritis, or inflammation of the bowels, is the principal. Like inflammation itself, it is of two orders—external and internal; the first being confined to the outer lining membranes of their organs, the other to their internal covering. The former of these, however, generally receives the name of enteritis, as it is accompanied by fever, sometimes severe, though usually marked by costiveness; while the other is of a less violent character, but generally attended by diarrhœa so severe that it may be mistaken for dysentery.

The attack of enteritis is often very sudden. On the previous day the animal may have been in perfect health, but on the morrow he will all at once exhibit protrusion of the head, inflammation of the eyes, heaving of the sides, trembling of the limbs, disinclination to move, or excessive weakness and staggering if he should make the attempt. His pulse is small and rapid, varying from 60 to 80 in a minute; and the heat of his mouth, as well as his ears and around the horns, is extreme. He evinces at the same time a disinclination for food, or repudiates it altogether, and his power of rumination is gone. His groans become intense from internal agony; and if any fæces are discharged, they are generally covered with a slimy mucus, or tinged with blood. They are hard too, but oftener there is an entire suppression of the intestinal evacuations. His pulse meanwhile becomes feeble, as the disease advances, and moaning perpetual. The brain next suffers, and he becomes in a great degree either blind or insensible. He breathes with difficulty, and his mouth is covered with foam. A thick brown deposit is seen on his tongue, and he swallows with evident pain and reluctance. Even liquids are avoided by him, and he grinds his teeth. His belly is tender and tucked up; and if there be a little discharge from its alvine extremity, it is usually so fetid and offensive that he is said to be “fardal-bound.” The urine is of a character equally irregular, being thick, oily, brown, and highly putrid in its smell. As the disease advances, the animal exhibits convulsive movements in its neck and extremities; sometimes lying down, but immediately getting up again. Eventually, the weakness increasing, it finally falls and dies, sometimes from sheer exhaustion of strength, but often in convulsions, accompanied with a discharge of bloody fluid from the nose, the mouth, and the anus.

This disease especially attacks strong and middle-aged oxen, particularly in hot weather and after long-continued drought. If

they have been previously overworked, they are more liable to it ; but calves, milch cows, and old animals are comparatively exempt. Sometimes it suddenly ceases, and the beast seems to revive. He eats to a small extent, and rumination returns. The pulse becomes slower, and the excrement more abundant. The agitation and enlargement too of his sides appear to diminish ; and on all quarters there seems a decided improvement. But the change is fallacious, and is generally followed by a relapse. He is so weak too, that he is unable to resist a fresh attack, and an exhausting fever frequently sets in, though oftener another series of convulsions occurs, and he sinks under their severity.

A *post-mortem* examination exhibits high traces of congestion in the subcutaneous and muscular structures. The whole of them are discolored and overgorged with blood, the latter being so disorganized that it has wholly lost its tenacity, and become one mass of offensive corruption. The intestines are likewise overcharged with blood ; a fluid consisting largely of it, but mixed with serum too, being often found in them to the extent of ten or twelve gallons. The peritoneum is inflamed, and has gangrenous spots ; the rumen still distended with the food the animal formerly had taken, proving there had been no digestion. The many-plus has adhering to it numerous dense layers which cannot be detached from it without difficulty ; and the fourth stomach, which is filled with a bloody secretion, has in it a large number of gangrenous patches. The small intestines present equal evidence of ulceration, and the rectum is gangrenous to its extremity. The liver is enlarged and soft, but easily torn, and in the chest there is the same effusion, but not to the same extent as in the abdomen. The pericardium and lungs are highly inflamed, the latter being either emphysematous or gorged with blood. The heart itself is covered with black spots, both externally and internally, and the whole of the air-passages, as well as the larynx and pharynx, are of a highly red color, indicating the extent of the inflammation that had prevailed.

The causes of this disease are exceedingly obscure. Exposure to cold, or drinking of cold water during hot weather, or when overworked, has been considered amongst the chief ; but it has also been ascribed to drinking undue quantities of saltwater, especially when largely impregnated with metals. Poisonous herbs on the grass perhaps also give rise to it, though cattle usually avoid these with wonderful sagacity ; but over luxuriant feeding or unhealthy food, may also produce it. Undue crowding of the animals has likewise been considered amongst the number of its causes, as well as the sudden disappearance or suppression of some cutaneous eruption. It is frequently, moreover, epidemic in its character. M. Creazel, a French veterinarian, who particularly describes it, mentioning that one farmer in the department of

the Nievre, lost 83 out of 113 attacked in a herd of 218. The summer, he adds, had been unusually warm, and, while the upland pasture was burned up, the acrid plants in the marshy grounds had acquired an additional and deleterious pungency.

The treatment of enteritis will be obvious—extensive bleeding and purging, followed by the administration of sedatives and tonics, when the inflammation has been severe, or the disease run its course till it has arrived at the stage of exhaustion. The blood should be withdrawn till the animal staggers, and the purgative medicine should be equally strong. The animal should be placed on low diet—gruel and mashes alone—and blisters or hot water applied to the belly. Great caution, however, must be evinced in the administration of the aromatics and the tonics until the fever is finally subdued.

There is a disease named *pantas*, or wood-evil, or moor-ill, which is but a modification of enteritis, and is generally induced by browsing on the young buds of the oaks or the ash, or other trees, at the approach of spring. Inflammation is thus produced in the mouth and its membranes, which extends to the stomach, and the bowels become costive in consequence of the acidity of the aliment. Some, however, consider this disease to be of a rheumatic order, in consequence of the loins and the organs there being particularly affected, especially the kidneys, which secrete a urine of a highly red color and pungent odor. But it more resembles enteritis, being, like it, marked by great constipation, hard fæces, and a mucus or bloody fluid surrounding the little that are passed. Its treatment is similar to that of enteritis, but on a more moderate scale, and the animals, it need scarcely be added, should be immediately removed from the noxious pasture.

Diarrhœa and dysentery now come to be considered as instances of enteritis in the interior membrane of the intestines. The former is not always to be considered as a disease, for it is frequently a beneficent provision of nature for carrying off unhealthy humours from the system ; and it is especially apt to follow any sudden change of food, whether from dry to succulent in the spring, or from green to dry in the autumn. In the early stages of Pleuro-pneumonia it is always to be reckoned a favorable sign, as it subdues the febrile affection which then exists. An animal thus affected the more readily becomes fat ; but the diarrhœa is to be dreaded when it assumes a confirmed or chronic character, whether it arises from excess of food, or feeding on noxious herbs, drinking unwholesome water, undue administration of purgatives, or, finally, an unhealthy state of the atmosphere producing an epidemic. The young are more liable to it than the old, and milch cows than working oxen ; but it is not in the least degree contagious.

Diarrhœa, therefore, in the first instance, is to be let alone ; but if it becomes confirmed, medical treatment is necessary. Con-

trary to what might be supposed requisite, a purgative medicine should first be administered—generally in the shape of a pint or a quart of castor oil, followed by an ounce of prepared chalk and ten grains of powdered opium, or a drachm of the latter alone, to which two drachms of ginger or four of catechu should afterwards be added. The castor oil may be repeated, if necessary, and the chalk again tried ; or alum whey may be given, and a drachm of Dover's powder night and morning ; taking care at the same time to keep the animal on dry pasture, or, which is preferable, feed it on gruel and hay.

Dysentery is a far more serious disease, and requires active measures at the outset. Under no circumstances whatever can it be considered a favorable sign, but is invariably to be regarded as one of the most fatal affections to which cattle are subject. It is a malady to which, of all others, they are most liable, and thousands of them annually perish of it, either as a distinct disease or as a concomitant on others. It is a frequent attendant on Pleuropneumonia, or on phthisis pulmonalis ; and is considered to bear the same relation to the ox as glanders or farcy do to the horse. It is the last stage of many complaints, and often makes its appearance on the cessation of others : as, for instance, chronic hoose, and the sudden suppression of any secretion or cutaneous eruption. Milch cows are particularly liable to it, when their supply of the fluid naturally terminates ; but it often arises from distinct causes, such as exposure to cold, and low or marshy ground, unhealthy food, especially feeding on clayey land or meadows lately flooded ; unusually sultry weather ; the vicinity of woods or stagnant rivers ; insufficient food, or over-feeding ; exhaustion, or over-work ; diarrhœa neglected, and many other causes.

The first indications of dysentery are usually a feverishness of the countenance, a dryness of the skin, a roughness of the hair, and a tenderness of the loins when touched. The animal appears dull, but uneasy, and constipation may at this period exist, or the evacuation may be hard, dry, and accomplished with difficulty. Slight shiverings may be observed, as well as an anxious expression. But in other cases purging may show itself from the commencement, though the excrement will be voided with pain and straining, tenesmus, and protrusion of the rectum. These symptoms may not disclose themselves at first ; the animal merely discharging her fæces oftener than usual, and more fluid than natural, but at the same time she rapidly loses both appetite and condition.

If the disease be acute the symptoms are more striking and severe. The face appears unusually anxious and heavy ; there is a frequent purging, great loss of appetite, and rapid sinking of spirits and health. The fæces are changed in their character ; they are surrounded with mucus, discharged with much force,

and to such a distance as to give rise to the name of "shooting." Vesicles of air, or bubbles, are at same time voided, and if these burst immediately on reaching the ground, it is deemed a favorable symptom; but if they remain several minutes unbroken on the excrement, the worst is anticipated. The animal however may remain many weeks in this condition. Months may even elapse before the result arrives; but the experienced stock-holder is not deceived; he knows that the beast is rotten, and that she will infallibly expire.

His anticipations are verified; the disease meanwhile goes on, and the animal is reduced to a skeleton. Swellings appear around the jaw; his teeth become loose, and vermin fasten on him as their prey. The eye sinks and loses its lustre, pus is mingled with blood in the evacuations, the anus becomes ulcerated in consequence of the acrid nature of the secretions, and the change is most offensively fetid. Swellings may appear around the joints and impart a momentary degree of thickness to the legs; but the emaciation, with loss of strength, meanwhile goes on; the whole frame sinks, cold shiverings and perspiration succeed; the stench from the animal or his evacuations becomes insupportable, and, to the relief alike of the farmer and himself, he dies.

An examination of the body after death presents comparatively few of the traces which might have been expected from the ravages of such a formidable disease. The liver and first and second stomachs are rarely affected; the third shows but small indications of inflammation; and though in the fourth there are more, as well as a considerable secretion of a serous fluid, there is nothing to account for the serious disorganization that prevailed; the small intestines being equally free from marks of irritation, and the colon, cœcum, and rectum alone being affected. M. d'Arbaval, however, mentions that in French cattle he has frequently seen signs of ulceration to a considerable extent.

In the treatment of a disease of an inflammatory kind so violent, recourse should immediately be had to bleeding, and this to the extent of from two to six quarts, according to the age and strength of the animal. A mild aperient may then follow, but a preference should be given to emollient injections. Opium should then be administered in half-drachm doses, mixed with gruel; or it may be given along with the injections also. A small dose of calomel may be added to the opium, if the latter be likely to produce undue costiveness; but alum or sulphate of iron as astringents should be avoided. A mixture of blue-pill and Dover's powder has also been recommended; and the beast should be well housed, as well as fed on mashes of bran, with a little hay or thick gruel. Setons have also been mentioned as beneficial when applied to the dewlaps; though more advantage may be derived from fomenting the right flank and side of the belly. Chloride of lime, in the

proportion of a drachm to the quart of water, may also be administered, either by the mouth or as an injection, with a view of correcting the offensive nature of the evacuations. When the disease has been finally subdued, astringents may be given, and of these, the vegetable, especially catechu, are the safest ; but, if they fail to act, recourse should be had to alum whey ; or a drachm of blue vitriol with half a drachm of opium may be given with safety.

On the recovery of the animal, care must be taken that luxuriant grass is not, for some time, placed within his reach ; and the diarrhoea, to which he may for some time afterwards be subject, must be treated with attention ; but there is no necessity for segregating him from the herd, in consequence of any apprehensions of contagion, as even if the disease had been formerly infectious, there is not the slightest danger of contamination now.

Inflammation of the duodenum and some of the larger intestines sometimes lead to all the chief symptoms of dysentery ; and colic has often been confounded with it, though the diseases are totally distinct. Bleeding and purgatives are required in the former of these affections ; but aromatic drinks are more necessary in the other, especially an ounce of ginger with twenty drops of the essence of peppermint, to which two drachms of the chloride of lime may be added with great advantage ; the chlorine dispelling the noxious gas which has been generated in the stomach of the animal. Gentle exercise, with friction on the belly and flank, may at same time be resorted to ; and, should these means fail, clysters, to which two ounces of tincture of aloes have been added, may almost with certainty be tried. What is termed the "spasmodic" is an affection which also sometimes occurs in cattle. It is a contraction or irritation of the small intestines, and is to be treated in a similar manner ; the animal being placed on warm mashes, gruel, and old hay after its recovery.

Inflammation of the rumen is often an attendant on many of these affections, but it is more frequently produced by the effects of irritant poisons. Notwithstanding the care with which the animal in general instinctively avoids noxious herbs, he is frequently tempted by their inodorous character and succulent appearance. The water-hemlock, hellebore, and the yew, are the chief of these deleterious plants ; but wild parsnips, black henbane, and most of the ranunculus order may also be added. All of these lead to symptoms severe, though obscure—sudden stupor and swelling, loss of rumination and appetite, grinding of the teeth, and convulsive fits. Should the causes of the disease be unsuspected, it will generally go on to a fatal termination, when the true origin of it will be found on examination of the paunch, where the poison will generally be found, though it may also have passed on to the other stomachs and small intestines. Little can

be done to counteract it in life, if severe ; though the stomach pump should be resorted to, or small purges administered before the animal sinks, adding tonics and aromatics afterwards if he recovers.

There is an indirect way, it may be added, in which cattle are sometimes poisoned—namely, incautiously dressing them with undue quantities of corrosive sublimate. The effect of this is much the same as that resulting from excessive doses of mercury in man ; and, in addition to being salivated, the animal may be violently purged, and exhibit bloody fæces. The remedy is similar : the whites of several eggs may be beat up with thick gruel, and poured down the throat to diminish the irritating action of the poison, and medicines afterwards administered to counteract its inflammatory effects.

Inflammation of the liver is an affection to which cattle are especially subject ; and consists of two orders—acute and chronic. The former may be the result of accident or of blows ; but it is more frequently produced by over-luxuriant living, and is particularly apt to show itself in stall-fed beasts. It presents all the marks of ordinary inflammation—heat of the mouth and base of the horns, dryness of the muzzle, loss of appetite, and suspension of rumination, acceleration of the pulse ; and, in addition to all these, a decided yellowness of the eyes and skin. The animal appears heavy and restless, and invariably lies on the right side, which, with the belly, is enlarged, and often exhibits spasmodic twitches. The attention of the animal is generally directed to this part of his body, and he either constantly turns his head round in this direction, or rests his muzzle on it. The intestinal organs are affected by it, and they apparently lose their tone ; for severe constipation is apt to follow, though the kidneys still more participate in the disease, secreting a yellow or high-coloured, and occasionally, a bloody urine. Stall-fed cattle, it has been observed, are liable to be most attacked with this malady, especially when they have been fed on oil-cakes.

The remedy consists in bleeding, blistering the part affected, and the administration of purgative medicines. The animal must at same time be placed on low diet, and all luxuriant or stimulating feeding avoided. If previously overworked, and the disease be thus induced, he must also be allowed to indulge in undisturbed repose ; and, on recovery, care taken that he does not too soon return to rich or luxuriant pasture.

The chronic inflammation to which the liver is subjected is of a less serious and far more obstinate order. It may exist or go on for years without its presence ever being suspected ; all that is observed being that the animal refuses to fatten, though its abdomen grows very large in consequence of the enormous size, occasionally upwards of a hundred and thirty pounds, which the liver attains.

This affection, unless it be productive of fever, requires no treatment, other than that of sending the animal to the butcher as quickly as possible ; but there is a second disease of the liver—that of yellows, or jaundice—which is of a far more serious and often fatal nature. It may arise from various causes, either constitutional or local ; the former including derangement of almost every organ with which the liver sympathises ; the latter being obstructions to the flow of the bile from local circumstances, such as the formation of gall-stones, hydatids, the presence of flukes, &c. A yellowness of the eyes and skin is its peculiar characteristic, whatever be its origin ; and it is often marked besides by an extreme itchiness or scaliness of the hide, which occasionally degenerates into mange. The animal falls off, and rapidly loses in strength and appetite as well as condition ; his thirst becomes excessive, and the power of rumination ceases. All the secretions assume a yellow aspect, including even the milk in the instance of a cow. Obstinate constipation generally ensues, and the beast is so lazy that it can scarcely be induced to move, though it usually may be seen heaving its flanks, and separating itself from others of the herd.

In this stage, fever and constitutional irritation of a high order frequently supervene, and rapidly prove fatal ; but if the disease arise from the obstruction of gall-stones, or the presence of flukes, it may go on for a long time without producing any serious consequences, excepting that the animal does not fatten, and that its milk, if a female, becomes useless or offensive, on account of its acrid and disagreeable taste. In this chronic state, little need, or can, be done ; but in the former, recourse must be had to immediate bleeding, to the extent of six or eight pounds, and sharp purgative medicines so soon as inflammation of the general system is indicated by the hard and rapid pulse, heaving of the flanks, heat of the head, ears,—sometimes varied by coldness of the latter—roughness of the skin, constipation of the bowels, high-colored aspect of the urine, and dark and hardened condition of the fæces.

Epsom salts, in doses of pound and a half, are the best medicine ; but if the constipation be obstinate, ten drops of croton oil may be added. Mashies should be given to accelerate their action, followed by opium if there be any violent irritation. Should it be suspected that this arises from the presence of a stone in the duct, digitalis may be substituted for opium, but no faith can be placed in any administration of potass, soda, or ammonia to dissolve it. Aromatics and tonics become useful when the fever is subdued ; and the animal should be, as soon as possible, turned out for a few hours to grass during the day.

The liver, in consequence of its highly vascular substance, is also subject to hæmorrhage, in consequence of its becoming overcharged. The latter condition is indicated by feebleness of the pulse, cold-

ness of the mouth, and paleness of it as well as the nose, on account of the suppression of the blood, and its undue absence from these parts. The animal also exhibits signs of extreme exhaustion, and breathes in a hurried, panting manner. If these symptoms be narrowly watched, the disease may be arrested at this time by smart bleeding and purgatives : but usually the affection continues wholly unnoticed, until a sudden rupture of the liver occurs, and a discharge of blood from it into the intestines—sometimes to the extent of eight or ten gallons—follows, when the beast immediately falls and expires.

Intimately connected with the liver is the duodenum, into which the biliary duct opens, and affections of it are frequently taken for those of the former organ. Inflammation is the most common malady to which it is subject—caused generally by the presence of an irritating gall-stone in the neighboring duct. The cause and the commencement of the disease are of course exceedingly obscure ; but a dose of digitalis will remove the obstruction, if it arise from this source. But the disease is, for the most part, beyond the reach of art ; as are similar affections of the pancreas and spleen, to which sometimes, though rarely, cattle are also subject.

Dropsy is another affection of the animal which is frequently associated with pulmonary complaints, in consequence of the influence which it exercises on the lungs, by means seemingly of the pressure of the water on the cavity of the chest. It is generally the result of inflammation of either the lining membranes of the intestines, or of any important organ connected with them ; the exhalent vessels of the membrane being thus stimulated to undue action, while the power of the absorbents is proportionally diminished. Water is thus deposited in undue quantity in the cavity of the abdomen ; or it may be formed in like manner in the chest, around the pleura, and even within the pericardium, surrounding the heart itself. It is often excited also by the sudden suppression of other secretions ; and, from whatsoever cause it arises, it so affects respiration that it is invariably associated with pleurisy or pneumonia.

Like most other inflammatory diseases, dropsy may be either of an acute or chronic order. Sometimes the peritoneum becomes the seat of such violent inflammation that, in the course of a few days, water is poured out to such an extent as to suffocate the animal by impeding the movements of the chest and diaphragm ; but generally the disease is of a slow and long-standing order ; the animal enlarging gradually in girth, though evidently it makes no corresponding progress in growth, as the limbs and every other part of the body fall off, while the belly swells, though they are sometimes distended by a puffy and œdematous inflation too.

Dropsy may be suspected in an animal whenever this enlarge-

ment in bulk, without any improvement in condition, shows itself. Gradually, however, the belly drops and the sides become proportionately flat; the animal grows dull and weak; is either unable or unwilling to move; while his thirst becomes excessive, though his skin is dry, and his coat is rough. The lining membrane of his mouth and nose at the same time assume a pale aspect, and the white of the eye a yellow hue. Constipation and diarrhœa follow each other in rapid succession, and respiration is so interrupted that a sense of suffocation compels him to start up so soon as he has thrown himself down for a moment to repose on the ground. Debility meanwhile goes on increasing, and when he is no longer able to rise, suffocation ensues, and death terminates his sufferings.

In the treatment of this disease but little can be done with the view of preventing it, but something may be effected by art to relieve the animal when the preternatural secretion has hopelessly set in. The animal having been tied up, a puncture is to be made with a trocar on the right side, three or four inches from the middle line of the belly, and about twice as many from the udder. The water will immediately flow, and immense quantities of it, sometimes extending from twenty to thirty gallons, may be removed; but the cure is seldom permanent, and the operation generally requires soon to be repeated, though the accumulation of the fluid may be retarded by the administration of purgatives or diuretic medicines, especially the latter, in the shape of half an ounce of nitre with a quarter of an ounce of turpentine, gentian, ginger, and tartrate of iron daily. No lasting cure, however, can be hoped for, and the animal should be disposed of so soon as he has again been brought into temporary good condition; though, if the disease is discovered, it will be better to kill him at the outset before the operation is resorted to.

Hernia is an affection to which cattle are frequently liable, either from congenital malformation or from being gored by their companions; and sometimes it exists to such an extent as to be mistaken for partial dropsy, and greatly to interfere with the function of respiration. The indications are a disinclination to move, a loss of condition, an anxious expression of countenance, and ready susceptibility to fright. A tumor, more or less extensive, may at same time be discerned extending from the abdomen, which yields to touch, as if it contained a watery fluid. No error, however, could be more fatal than that of puncturing this tumor in the supposition that its contents were fluid; for the intestine would thus be wounded, and either death, or enteritis on the most extensive scale, would follow. The true remedy consists in carefully dissecting the skin, and placing two or three stiches in it after placing the bowel carefully back. No attempt to accomplish the latter result will be successful without the performance of this operation, as the intestine will fall down again so soon as

pressure is removed. It is generally most advantageous in such cases to get rid of the animal at once, rather than run the risk of recovery by the knife.

There is a more serious case of rupture—that of the diaphragm, or midriff, which occurs in cattle, in consequence of the over distension of the first stomach, and it is invariably fatal. It is marked by all the symptoms of hernia, but in a more aggravated degree; and its existence is rarely ascertained till examination discloses it after death. Not the slightest remedy can be proposed for it, as it never fails to inflict sudden death upon the animal; whose carcase, however, under such circumstances, is not unfit for food if promptly bled immediately on his fall.

The bowels of cattle are also subject to strangulation, in consequence of their becoming involved in a knot while in contact with each other. Considering their enormous length, it is a matter of surprise that this does not occur more frequently than it does; but still it is found to such an extent as to cause a well-founded dread, under the name of “net” or “knot.” Its symptoms are those of hernia in an aggravated degree; and, unfortunately, there is not the slightest remedy for it, as its existence is never ascertained till examination after death.

There is an analogous affection of the intestines also, known by the name of “cords” or “gut-tie.” It usually arises from the unskilful manner in which the operation of castration has been performed, and the retraction of the spermatic cord into the abdomen, where it forms a nucleus for irregular deposits. Frequently, however, the cord seems to be of spontaneous origin; but from whatever cause the malady arises, the animal soon exhibits symptoms of disease; his belly swelling; his respiration becoming hurried and laborious; the pulse small and rapid; the limbs, ears, and nose frigid; the mouth and nostrils pale. It usually attacks young animals, and often proves fatal a week after its appearance. No certain remedy is known for it; but a good deal may be done by bleeding and the administration of purgatives so soon as indications of disease are exhibited.

Intro-susception of the bowels is another affection occasionally observed. It is very apt to follow colic, and consists of one part of the intestines forcing its way back into the interior of the other, and forming adhesions there, which, of course, entirely stop up the alimentary canal. These maladies are altogether beyond the reach of art, and are rarely discerned until the animal has become their victim.

Worms are occasionally found in the intestines of cattle, and give rise to much restlessness on the part of the animal, as well as an anxious expression of countenance, which may be mistaken for more serious diseases. Hydatids are also apt to form in the brain, and flukes in the liver; and worms of a peculiar order are found

frequently too in the pleura, lungs, and spleen. In the first-named instance, they may be readily expelled by any vermifuge. In the other they are beyond the power of medicine, but may exist for a long time without materially affecting the health of the animal.

Diseases of the brain itself are of a more serious order, and often give rise to great sympathetic derangement on the part of the respiratory organs. In addition to the presence of hydatids on a large scale, tumors may be formed within the substance of the brain, or effusions of blood or pus may exist upon its surface. Any of these causes will give rise to laborious breathing on the part of the animal, loss of appetite, suspension of the power of rumination, dryness of the muzzle, heat around the horns and ears, and all the other symptoms of fever. Bleeding and brisk purging may in the first instance arrest them; but the animal will eventually sink unless an operation be performed for giving vent to the foreign or diseased bodies by means of puncturing. This is accomplished by cutting down through the skin and skull, at a part where previous tapping with a small hammer indicates the point where the malady is supposed to exist, but the operation is so uncertain, and so difficult to perform, in consequence of the restlessness of the patient, that it is better to destroy the beast at once.

Hydrocephalus, or water in the head, is a disease to which young cattle, as well as human beings, are especially prone. The fluid exists between the membranes, and often is deposited to such an extent, even before birth, that the bones of the head thus become so enlarged that it is necessary to destroy the progeny for the sake of preserving the life of the mother. If the animal however succeeds in reaching the light, a timely puncture of the large swelling over the frontal sinus may frequently save it. Usually however the disease goes on. The beast exhibits a ricketty and staggering appearance, refuses to suck, assumes a stupid or comatose and insensible aspect, and dies with all the symptoms of apoplexy. On examination, water will be found in large quantities, often to the extent of several pints, not only between the membranes of the brain but in the ventricles also.

Cattle, when unduly vigorous, are frequently subject to apoplexy. The affection generally arises from over-feeding, most commonly in stalls, in consequence of the forcing system which now to such a ruinous extent prevails, and it is rarely attended by any symptoms of previous warning. The animal may for a few days before evince drowsiness and heaviness of the head, indicating that the brain was undergoing some unusual pressure; and, in such instances, timely bleeding and purging may save it. But nothing is generally seen until he suddenly staggers, sinks, and expires—often in the course of a few minutes—so rapidly that the disease has received the name of “blood-striking,” in consequence of the determination of that fluid to the head.

Phrenzy, or "sough" in cattle, is an inflammatory disease of the brain, which give rise to much derangement of the respiratory organs. It usually arises, like apoplexy, from over-feeding or luxuriant pasture; and is marked by heaviness of the animal, protrusion of the eyes, foaming of the mouth, comatoseness, and frequently inability to move. On other occasions, however, it assumes the aspect of delirium, and the animal becomes excited in the highest degree; rushing and goring at every object, though it often searches out one—generally a human being—whom it pursues with ferocious resolution: it bellows hideously, and, while the sides are collapsed, the tail is erected high in the air. The retina is occasionally excited, especially by the presence of any red or brilliant substance, against which the animal furiously gallops, though he frequently falls down and becomes insensible or expires. The disease is also often brought on by over-driving, especially in hot or sultry weather, and nothing is more common than to observe it in the streets of crowded cities, where the animal is rendered still more infuriated by the shouts of the multitude. In these cases the sooner he is destroyed the better—either by a bullet or the knife. In other instances blood-letting and purging on an extensive scale should be resorted to before the disease has attained such extremities.

Epilepsy is a disease of a similar nature, but more modified character. It usually attacks young cattle, instead of being, like phrenzy, prone to assail the full-grown; and often comes on as suddenly as the other, though a heaviness of the animal will generally be observed to precede it. Suddenly, however, in most instances, he staggers and falls, bellowing fearfully, and discharging from his mouth a frothy fluid, often mixed with the food he has been ruminating. The flanks and abdominal muscles are violently agitated, and the jaws are firmly clenched. He frequently also grinds his teeth, and every limb appears convulsed, though other muscles are so paralyzed that the bladder and intestines are involuntarily evacuated.

The cause of this disease is unknown, though, as in the human being, it is probably of nervous origin, following on some derangement of the digestive organs. As in the instance of man, too, it is seldom fatal in its attacks; but the animal, after lying in this state for some time on the ground, gets up and rejoins the herd in grazing, seemingly well as ever. The attacks, however, almost invariably recur, and increase in frequency as well as severity; so that in most cases the beast had better at once be consigned to the butcher, so soon as he regains temporary condition.

Tetanus, or locked-jaw, is a somewhat similar disease, but of comparatively rare occurrence in cattle; and is seldom discovered until it has made fatal progress. The animal may have been overworked; and he will suddenly evince a repugnance to food,

an inability to ruminate, and disinclination to move about. He remains fixed, in the same position; but there is no appearance of inflammation indicated by the dryness of the muzzle, or the heat of the horns and ears. This singular attitude at last attracts the attention of the herdsman or his master; and, on examination of the mouth, the jaws will be found firmly clenched. The discovery and remedial means, however, are generally now too late; though he should instantly be bled till he staggers, and half a drachm, or two scruples, of croton nut farina, followed by a dose of a pound and a half of epsom salts, administered so soon as the muscles of the jaw relax. Reliance must be placed on the former medicine in the first instance, as the mouth can rarely be opened to such an extent as to permit the prompt exhibition of the other. Opium, to the extent of a drachm thrice a day, should then be given, to allay the nervous excitement, accompanied by mashes, until the animal has sufficiently recovered to be again turned out.

Palsy is an affection of a totally different order, arising from prostration or utter loss of the nervous power. It is frequently observed in the hind limbs of cows after parturition; but then is usually only of a temporary nature. It more frequently arises from overworking the animal, and keeping him on low inadequate food, in marshy districts during the night. Frequently it is preceded by rheumatism, and then is slow in its progress. The beast evinces general debility, and a trembling, accompanied sometimes by a coldness of the limbs. Next, he stiffens and staggers in gait, exhibiting a strange awkwardness of the limbs—usually the posterior—and reluctance to move, until he finally falls. Old cattle, and especially cows, are most liable to the disease, and it is, above all, engendered by the offensive and unwholesome air which is often found in the ill-ventilated atmosphere of a cow-house, particularly if in the neighborhood of stagnant water; though it sometimes also arises from turning the beasts too early to grass, after they have been comfortably housed during the winter.

The treatment of palsy should be of a very different order from that of most of the diseases hitherto mentioned. Tonics and stimulating medicines are required to restore tone to the muscles and strength to the animal: but the condition of the bowels must at the same time be attended to; and, if these are costive, aperients administered. Much may also be done by the application of stimulating liniments to the parts—consisting of equal parts of camphorated spirit, hartshorn, and oil of turpentine. Some veterinary surgeons recommend that the animal should also be slung; and French practitioners, besides, advise the administration of *nux vomica* in ounce doses; but good littering in a warm cow-house is perhaps preferable to the one, and the danger incidental to the exhibition of such quantities is to be considered in the other.

There is, it may be added, a particular species of painful affection of the foot, especially in working oxen, in which paralysis or palsy of the part would be desirable. It may result either from excessive labor or improper shoeing ; and is analogous to a similar malady in the horse, or what is termed *tic doloireux* in the human being. And the operation that has been suggested for it is of a like order—cutting down upon the part, and removing a portion of the nerve affected.

The kidneys are often the seat of diseases which react considerably upon the pulmonary organs. Inflammation of the former is almost immediately followed by impediment to respiration in the latter. The breathing as well as the pulse is accelerated, and both become hard as well as rapid. The first indications of the disease are usually a straining effort to evacuate the bladder, and its discharge at intervals, in smaller quantities than usual. It is of a darker hue than natural, and frequently tinged with blood. The animal appears dull and rejects his food. As the inflammation increases, he groans deeply ; and similar pain appears to be produced on voiding the intestinal excrements, which at first have an aspect of diarrhœa or dysentery, but ultimately become small, hard, and offensive in odour, prior to disappearing altogether. The urinary secretions now undergo a similar change, and, from being at first profuse, becomes altogether suppressed. Cold sweats break out, and the difficulty of breathing increases. Trembling seizes the beast, and he moans perpetually. Ultimately his pulse can scarcely be discerned, and his posterior extremities become paralysed. In this state he generally falls and expires within four days of the attack.

The disease is often brought on by damps and cold, but it is generally the result of over-feeding, especially in the spring of the year. As it is entirely of an inflammatory nature, the usual course of treatment adopted in inflammation must be resorted to—bleeding, purging, and afterwards the administration of clysters. Mustard poultices may likewise be applied, as well as fomentations to the loins ; the animal being at same time placed on low diet—gruel, bran mashes, and a small allowance of succulent food.

But a far more common affection of the kidneys is that known by the name of red-water, in consequence of the deep red hue which the urine then presents. It is an inflammatory affection, and, like most maladies of this order, may be either acute or chronic. The former is the more serious disease, and is connected with the kidneys alone ; the latter originates rather from the liver, and is of a much less dangerous, though of a more protracted order. In scientific language, the first is named *hæmaturia*, and generally arises from over-feeding, especially on cold marshy ground ; though some veterinary surgeons allege it is more apt to be seen on over-drained land. A particular condition of the soil appears

to materially influence it ; as in one district, or even one part of a farm, it may rage most violently, while cattle in the adjoining are entirely free. The spring of the year, when the leaves are budding, and the autumn, when they begin to disappear, are the most dangerous periods for attack ; and cows are especially liable to the malady a week or two before parturition. It breaks out at times so simultaneously amongst large numbers of cattle, that it has all the appearance of an epidemic ; but it is in no degree contagious.

Acute red-water presents all the usual signs of inflammation, and that of the acutest character, inasmuch as it generally exhibits bloody urine from the commencement. Dysentery has often preceded it, and as soon as that ceases, the other is developed under the aspect which its name denotes. The lungs at same time act with difficulty ; the mouth, ears, and horns become heated, but the limbs grow cold, and the loins are tender. Generally inflammation of the bowels and adjacent organs follows, and the animal usually dies in a few days ; when a *post-mortem* inspection shows the kidneys to be enlarged as well as inflamed, the peritoneum the subject both of adhesion and effusion, and the intestines either ulcerated or inflamed.

Bleeding is the main remedy to be relied on in the treatment of this disease, which arises chiefly from an undue determination of blood to the parts. Purgatives should follow, though in this affection they are often singularly destitute of power. Aromatics may be conjoined with them, if they have been repeatedly administered in vain ; but they must on no account be stopped till the constipation has been subdued. Unless this can be effected, the inflammation in the kidneys will increase, and the blood as well as the urine assume a darker hue. Death will speedily follow ; but if purging be established, a favourable issue may be anticipated, in which instance, the spirits of turpentine, the balsom of copaibæ, and half an ounce of laudanum may be given to diminish the irritation in the kidneys.

Chronic red-water is a much more common affection than acute, and is proportionally divested of danger. Usually the animal's urine is observed to be brown coloured or yellow ; but he browses as before, and in a few days a slight diarrhœa comes on, leaving him well as ever. But the symptoms of the disease may become more severe. Instead of being dull, he may grow languid, refuse his food, and cease to ruminate. He will droop his ears, and bend his back. The urine will assume a darker hue ; and yet again he may seem to regain his former condition, but it is only a relapse. Febrile symptoms set in, and urine becomes almost black. The skin at same time assumes a yellow hue, and the conjunctiva one more yellow still, indicating that the liver is the chief seat of the affection ; and gradually the disease will assume all the aspects of inflam-

mation of this organ, as well as its fatal termination, unless it be arrested by timely bleeding, if fever be present, or by purgatives, such as Glander's as well as Epsom salts, in the proportion of a pound each, with half a pound of sulphur, if it be not. Most commonly, however, both of them will require to be resorted to together, accompanied with emollient injections, and followed by aromatics, gruel, linseed tea, and mashies of young grass, with fresh vetches and a few carrots, to which a little ginger or columba powder may be added, generally a drachm of the former and two of the latter.

Black-water is another affection of the kidneys, indicating a disease more dangerous, as it is usually a proof of a similar change in the blood, owing to decomposition. It is often a sequel to chronic red-water; and when it is so, the result is generally fatal; the various organs having been so completely broken up as to be beyond the influence of medicine.

Several other diseases are connected with the urinary organs—such as stone in the ureter, stone in the bladder, inflammation of bladder, &c. ; but excepting the latter, which, when severe, frequently extends its influence to the chest, they are in no degree related to the seat of respiration. Some affections of the nostrils are more so; polypus in the nose, and larynx, or inflammation of its lining membrane, sometimes seriously affecting the breathing; but to these it is unnecessary to allude. Glanders is a disease happily still unknown in cattle; and though something like farcy has been discovered, the cases have been so rare as to require no particular notice.

Some diseases of the skin and integuments, however, require to be briefly considered, as when these are so affected as to impede or altogether stop perspiration, they re-act upon the chest and its organs of respiration. Other diseases in turn exhibit themselves on the skin. Almost all affections of the liver, and many of those of the abdomen and chest, give rise to a stiffness and roughness of the skin, which thus becomes one of the unerring signs of their existence. This stiffness, or staring appearance, is produced by the absorption of the oily fluid beneath the integument, and gives origin to a disease itself named hide-bound. The symptoms of it are that the skin, instead of being loose and easily elevated as in health, clings firmly to the tissue beneath, and becomes hard and dry, as well as covered with small scales. Whenever this state is discovered, it should not be neglected, for it is an infallible proof either of isolated disease in the integument itself, or in some of the vital internal organs. If the former, eight ounces of sulphur, with half an ounce of ginger, and a few mashies, will readily subdue it; should it be occasioned by the other—generally derangement of the digestive functions—it must first be averted. The condition of the respiratory organs ought at the same time to be

narrowly watched ; for a little caution may prevent hoose degenerating into consumption, or an ordinary cold from becoming a dangerous attack of pleurisy or pneumonia, or presenting the leading features of both.

Mange is a far more formidable affection of the skin, and is one of the few diseases of cattle that really are contagious. It generally is produced by low living ; but too luxuriant food will also give rise to it ; or it may follow on any sudden transition from one to the other. Want of cleanliness, or if due attention to ventilation is not observed, is likewise a frequent cause ; and from whatever source it may proceed, the disease first exhibits itself in an appearance of general itchiness, but particularly about the tail. The animal consequently rubs itself against a post, or any other object within reach, and the hair being thus detached, the skin is irritated and ultimately affected by scabs and ulcers. These readily, however, yield to the application of an ointment consisting of a pound of sulphur, four ounces of turpentine, and two ounces of strong mercurial ointment, dissolved in a pint of linseed oil. This is to be applied with a brush night and morning ; and internal doses of sulphur should also be administered. Mashies must be allowed the animal every night, and he must be carefully separated from the herd to prevent contagion.

Leprosy is a loathsome affection both in cattle and in man ; but fortunately, in the present day, of equal rarity in either. It sometimes, however, arises from neglected mange, the skin becoming corrugated, thickened, and scaly, with corroding ulcers beneath. Deep chaps make their appearance on the flanks of the animal, and his eyelids swell to such an extent that he is almost blind, while an offensive yellow mucous flows from his nose, and his nostrils as well as lips become so thickened as greatly to impede respiration. If the disease be neglected, small bodies of a grape-like appearance will spread over the whole integuments, and these ultimately suppurating, will convert the animal into a mass of moving disease.

The treatment consists in promptly bleeding as well as purging the victim. He must at the same time be sustained by mashies and abundance of succulent food ; the renovating power of the skin and constitution generally being often in this disease reduced very low. Inflammatory symptoms may nevertheless again present themselves, which are only to be subdued by fresh recourse to physic and the lancet. The ointment, mentioned in the remarks on mange, may simultaneously be used, accompanied with solutions of the chloride of lime for several days, if the discharge from the sores be, as usual, offensive.

To such affections of the skin as lice, warts, and warbles, it is unnecessary to allude, as every stock-owner or herdsman is familiar with them and their treatment.

Such are the diseases which require to be kept in view when taking into consideration any cases of Pleuro-pneumonia. It will be remarked how few of them are contagious, and that no affection of any vital internal organ really ever is so. There is no reason to conclude that the Pleuro-pneumonia forms any exception to this general rule; and the able investigations of the Commission lately instituted by the Government of Victoria fully corroborate this opinion.

The inquiries and experiments made by this committee were equally comprehensive and minute. They distributed circulars, requesting information, to fully four hundred owners of cattle in the colony, and the result of their deliberations was based alike on the information thus received and their own conclusions. In a previous report they had given a description of Pleuro-pneumonia, its general and local symptoms, and morbid appearance in the case of cattle; and the only fact they overlooked was that a similar disease had been known in Europe even prior to the year 1745. The alleged introduction into England that year by the importation of two diseased cattle from Holland occupied too much of their attention. They do not appear to have consulted French or any other continental writers on the subject; though the opinion they arrived at—that it was non-contagious—was equally corroborated by observation then and experiment since.

They might too have enlarged on its recurrence in England during the year 1841, and the subsequent three years when it was so destructive to the cattle of Ireland; but their inquiries into its existence as an epidemic at the Cape of Good Hope, where it is said to have attacked horses and mules, as well as horned cattle, were possibly more germane to this colony.

Great attention was evidently paid by them to the alleged introduction of this disease from an English cow, imported in 1858; but their refutation of the erroneous popular belief is not sufficiently conclusive. They have attached too much importance to the opinions of European cow-leeches that the malady is contagious—opinions evidently dictated by self interest and inspired by ignorance*—and have not attributed due weight to the issue of their own experiments; still their report is able, though pregnant with danger to the community in announcing that the consumption of the flesh of animals in all stages of Pleuro-pneumonia (as their words virtually imply) is attended by “no injurious consequences;” whereas they ought to have stated that in the early stage alone it could be used with impunity.

* The following is a succinct account of dropsy by one of these cow-doctors: “It is a stoppage of the gall pipes which lead from the gall to the bladder, and enter the neck of the bladder, from whence there is a passage between two skins to the bottom, before it enters the bladder. When the pipes are too much forced, or stopped by gluent matter, the urine cannot find a free passage, but oozes out, and in time fills the beast’s body.”

The experiments which they instituted were made on entirely healthy cattle, imported from Tasmania for the purpose, as it was considered that no animals could be obtained in Victoria altogether free from the disease ; and they took place in a paddock wholly sequestered from any communication with the native breed. They are accordingly to be relied upon, as based upon the fairest circumstances and the most conclusive foundation, extending over a period from the 10th February, 1864, when the cattle first arrived from Launceston, till December of the same year, when the report was finally made up.

These experiments were, in the first instance, directed to the inquiry whether Pleuro-pneumonia was communicable by the nasal mucous ; and after four trials—during which the secretions from the nostrils of diseased animals was inserted into those of sound ones, under the most favorable circumstances for producing infection—it was determined that no injurious consequences followed. The bronchial exudation from affected beasts was, in two instances, with equal futility, inserted into the nostrils of healthy cattle ; and in four cases, uncontaminated animals were exposed to the breath of diseased, without producing the slightest effect. In two cases the saliva of contaminated animals was introduced into the mouths of sound ones ; and in one experiment the blood of a diseased beast was injected into the subcutaneous tissue of a sound one. Two experiments were made in which healthy animals were allowed to drink from the same water in which diseased ones had previously quenched their thirst ; and in two cases, both healthy and unhealthy cattle were allowed to have the most free communication, not only in the external air, but also in the solitary stall of a shed ; but in every instance it was found that the healthy animals sustained no injury whatever.

The Commission next directed their inquiries into inoculation, and the result was equally conclusive that the disease is not thus either modified or communicable. In arriving at this opinion, they were mainly guided by the fact, that each veterinary surgeon or professed inoculator attributed success chiefly to his own mode of performing the operation, or of preserving the virus ; every instance in which it failed being attributed by him to want of dexterity on the part of his rivals. They were also influenced by the circumstance, that every disease has a tendency to moderate or wear itself out ; and with justice quoted the opinion of Dr. Headlam Greenhow, an English authority, that “admitting pulmonary murrain to be contagious, it is contrary to all analogy that the specific virus of the disease (allowing the fluid squeezed out of the lungs of diseased animals to be such) should not exert its influence on those organs which are the normal seat of the natural disease.”

The doctor goes on to state, that “Whether a person inhales

the small-pox contagion with his breath, or has it inserted into the surface of his body by means of a lancet, is immaterial as regards the seat of the consequent local affection. In either case, the characteristic symptoms of small-pox present themselves in the skin. The same rule applies to contagious diseases. It also applies to common as well as morbid poisons. However introduced, arsenic affects the stomach, and cantharides the kidney. It might reasonably be expected to hold good in pulmonary murrain, if the inoculation really possessed any specific effect apart from the local injury sustained. It is admitted that when pulmonary murrain does occur, after what is termed a successful inoculation, its course and severity are uninfluenced by the preceding inoculation. This circumstance is altogether at variance with the pathological fact upon which inoculation is based, namely, that the organization having once passed through certain contagious diseases, either is thereby rendered altogether insusceptible of being affected by the contagion in future, or subsequently undergoes the disease in a very mitigated and comparatively harmless manner. Isolated and rare exceptions only occur to this rule."

It is but fair, however, to add, that the Commission state they "have had, from practical observers of stock, very strong and very opposite opinions as to the value of inoculation ; but on all sides it is admitted it does not confer an absolute protection. One witness, who gives evidence before the Commission, mentions an instance where a herd of cattle being infected with Pleuro-pneumonia, it was resolved that they should be inoculated ; but, owing to some delay or other cause, inoculation was not performed, yet from that time no new cases occurred in the herd. Now, if the proposed inoculation had taken place, the sudden cessation of the disease would, no doubt, have been improperly attributed to the effects of that operation. A knowledge of the possible occurrence of such instances goes far to account for the conflicting opinions prevalent amongst owners of stock as to the value of inoculation."

They further remark, "We desire to point out the fact, that the morbid appearances are now of a less severe character than those observed when the disease was first introduced into this colony, that whereas at that time extensive gangrene and grey hepatization of the lung were not unfrequent, now the stage of red hepatization is not often passed. We have not been able to avoid the observation that the operators in inoculation who have come forward to state their experience, have each (as a rule) laid great stress on his own mode of taking the matter and performing the operation, as the only effectual plan, and these methods have widely differed, yet, according to his own statement, the success of each seems to have been all that he could have wished."

Out of seventeen diseased animals, which the Commission had under observation, four recovered, or were under process of

recovery : and a *post-mortem* examination of the others, made immediately after a minute examination of each animal during life, proved that the natural cure consists in organisation of the coagulable lymph effused into the connective tissue of the lung. An imperfect dense fibro-areolar tissue was formed in great quantity in and around the lung, and the lobules of each, partly in consequence of the pressure to which they were subjected by this adventitious contracting web. The animal thus recovered, but with a lung more or less atrophied. Acephalocysts, the Commission remarks, "having been frequently found in animals affected with Pleuro-pneumonia, and also in a few cases *echinococci*, *strougyl*i and *distomata*, it may be asked whether any of these animals cause the disease?" but as in many cases of Pleuro-pneumonia no parasites were found, while in the lungs of healthy animals the insects were seen, the Commission determined in the negative.

Such is an impartial account of the labors of this Commission ; and the inference they draw is, that as inhalation of the breath of diseased animals, contact with them, drinking out of the same vessel, contact of the secretion from the mouth and nose of diseased beasts with the corresponding parts of healthy animals, fail to communicate the disease, Government should revoke its declaration of certain districts clean or unclean, as unnecessary and undesirable, and only entailing loss and inconvenience, without any reasonable probability of stopping the spread of the disease.

Several of the investigations and experiments made by this Commission were interesting. The first was that of a small Brittany cow, suffering from Pleuro-pneumonia. On examination, the right side of the chest was dull on percussion, and issued scarcely any sound of respiration ; but on the left side, the sounds were heard, and the percussion note was clearer : the breathing was distressed, accompanied with occasional cough, and the eyes were dull ; there was mucous discharge from the nostrils ; the coat was staring, and the animal was costive, as well as refused its food. This animal was supposed to have Pleuro-pneumonia on the right side ; and on examination after death, the right pleural cavity was found to contain about a gallon of serous fluid ; the parietal and pulmonary layers of the pleura were roughened by recent dirty-grey honey-combed lymph, about a quarter of an inch thick ; the anterior and upper portions of the pleura were unaffected ; the posterior lobe of the right lung was much increased in weight and bulk ; it contained little or no air, and was in a state of red hepatization, many of its lobules being well marked out by intersecting bands of cellular tissue, infiltrated with fibrinous lymph.

The second was a red cow, also purchased as diseased, and supposed to have Pleuro-pneumonia on the left side. During life, the breathing of the animal was distressed, and there was a mucous

discharge from the nostrils ; the coat was unhealthy, but not exactly staring. On the left side, there was dulness on percussion, accompanied by increased parietal resistance, but an absence of breath sounds, excepting near the spine. On the right side, the percussion note and respiratory sounds were considered to be natural ; and on opening her after death, the right pleural cavity was found to contain several quarts of serous fluid, there being also thick layers of yellow lymph on the parietal and visceral pleura. The right lung was much reduced in size, and of a dirty slaty color, containing but little air. It was easily altered in shape by pressure, and not unlike a piece of dark decomposing muscle. The left pleural cavity also contained some fluid, and thick layers of yellow lymph on its pleura. The left lung was much increased in size and weight, and, although friable, it resisted alteration of shape by pressure ; the anterior lobe was of a dark brown color on section, presenting bands of lighter-colored infiltrated cellular tissue, the posterior lobe being of a deep crimson. The heart was flabby, and contained coagulated blood. The rumen contained about twenty-eight pounds of food ; the second and third stomachs were healthy, the fourth stomach presenting a slight reddening of its membrane, but probably healthy also. The pharynx, larynx, intestines, liver, and kidneys were healthy ; and the Commission add, that these appearances showed that the right lung had been compressed by fluid exudation from its inflamed pleura, but had not itself suffered inflammation. The left lung had been inflamed throughout, and its anterior lobe, as well as undergone some compression from exudation on its inflamed pleura. It was probable, they further state, that while on the left lung Pleuro-pneumonia had existed many weeks, the inflammation of the right lung was of a much more recent date.

In the first experiment, two sponges were passed into the nostrils of the first cow, and, after being soaked with mucus, were applied to the interior of the nostrils of a healthy cow, where they were allowed to remain about a minute, so as to insure application of the mucus, and then withdrawn. The animal thus treated was subsequently examined repeatedly ; but at the end of six weeks still presented no symptoms of disease. In the second experiment, a black cow, previously found to be healthy, was secured in a stall, and a portion of thick fibrous material of a red color, ejected after a cough by the first named cow, was taken up from the grass, and, after the lapse of about half an hour, inserted into the right nostril of the black healthy cow, where it was allowed to remain ; but yet, two months afterwards, no infection was visible, nor had any sign of illness been displayed in the interval.

In the fifth experiment, with a view of testing whether the air exhaled by diseased animals could infect healthy, a shed was

fitted up with two stalls, separated by two layers of iron network several inches apart, in one of which was placed a cow in the last stages of Pleuro-pneumonia, and an entirely healthy cow in the other, so that they could breathe the same air, but not come in actual contact with each other; and, at the end of several days, the former died, while the other exhibited no symptoms of illness. A second diseased cow was placed in the same stall, and lived three weeks; but the healthy animal still continued uninjured.

It would be vain, however, to repeat any more of these investigations and experiments, as they have recently been published in a Parliamentary report, and they fully bear out the truth of the conclusion at which the Commission arrived with respect to the various circumstances in which it was possible for one animal to infect another.

Various observations, previously made in America, confirm the soundness of this Commission's opinions. The late distinguished statesman of the United States, Daniel Webster, was noted for his attachment to agricultural pursuits; and having had a considerable number of cattle destroyed on his farm at Marshfield, Massachusetts, by Pleuro-pneumonia, he was curious enough to have one of them examined by a competent authority, and the result was sent to a veterinary society at Boston. The animal, according to this report, after death disclosed a right lung considerably smaller than the left, and firmly attached to all the walls of the chest by strong adhesions. The posterior part of the lobe was much atrophied, and detached from the other by a dense web of connective tissue. The bronchi were much obstructed, and, towards their termination, cysts of yellow matter were found in the substance of the lung. The pericardium was healthy, but the heart was flabby. The muscular tissue was pale and the skin had a yellow hue; but the mouth and gullet, the larynx and trachea, were red with traces of recent inflammation. The liver contained several cysts, and seemed to have been in some degree affected. The spleen also contained one or two similar cysts of a smaller size; but the stomach, the intestines, and kidneys, were healthy. The animal, when in life, had exhibited strong signs of painful and difficult respiration, dullness on percussion, and all the other symptoms of Pleuro-pneumonia so far as they are visible then.

In the beautiful valley of the Shenandoah, once so teeming with fertility, but now so desolated by civil war, Colonel Washington, a grand-nephew of the great founder of the American republic, was noted for the possession of a herd descended from some cattle imported by his illustrious ancestor from England, ere the days of the quarrel which separated Britain from her colonies; but some years ago, Pleuro-pneumonia broke out amongst them and destroyed fully three-fourths of their number. On examination of these after death, upwards of a gallon of water

was found in the pleural cavities, with layers of lymph varying from an eighth to a whole inch in thickness, and forming adhesions in many parts. Both lungs were usually congested, but one to a much greater extent than the other; their structure, too, was generally hepatized; and the bronchial tubes bore marks of inflammation as well as obstruction. The fauces were generally healthy, but the cellular tissue was œdematous. The stomachs and intestines usually indicated no appearance of disease; but the liver, kidneys, and spleen were generally congested.

Kentucky, which, amongst foreign states, bears such a proverbial reputation for its fighting propensities, though it is in reality now one of the most pacific in its character and devoted to agricultural pursuits in the American Union, has also been ravaged by this scourge amongst its herds. Major Starkie, a distinguished breeder there, who suffered more than usual from it, records all the ordinary symptoms as having occurred in his cattle prior to death—great difficulty and evident pain in breathing, heaving of the sides, feebleness yet hardness and acceleration of the pulse, scurfiness of the skin, dullness of percussion and absence of the usual respiratory sounds when examined by a professional cow-doctor, general emaciation of the body, though the limbs to a great extent preserved their muscular substance, loss of appetite, and general debility of the animal before dissolution, when one of his lungs at least was found completely hepatized.

In the great agricultural State of Ohio, on the opposite side of the river of that name, the same disease and symptoms have frequently been seen and described, especially by Mr. Stanley Mathews, once an eminent lawyer in the City of Cincinnati, so noted for its pork market—the greatest in the world—but now a general of renown in the American army. Still further west, in the City of Chicago, which now disputes with the other the honor of being the true porkopolis of the United States, and is, undoubtedly its greatest corn market, a race of Scotch cattle, imported by the Scotch, who muster in such numbers there, has been far more than decimated by the same disease. An intelligent farmer from Perthshire there, who in his youth had studied medicine, describes it as introduced by a cough and groaning sound, indicating disturbed respiration on each side of the chest; the fauces were natural, but the flanks much agitated; there was dullness to percussion on one side, and the breath sounds were not distinctly audible on the other; the animals were generally much emaciated, and refused their food; the skin was usually yellow and scurfy, and the secretion from the nostrils offensive. The pure and agreeable breath of the cow had wholly disappeared.

At the very opposite extremity of the American Union—in the delightful State of Louisiana—the Honorable Pierre Soulé, a few years ago the representative of the country in Spain, formerly

one of the most distinguished lawyers in New Orleans, had imported a splendid breed of cattle from France, of which country he was a native. They fared, however, no better in the genial climate of New Orleans than they had on the banks of the Loire from which they came, or their Scotch compeers in Chicago. A large number of them were cut off by Pleuro-pneumonia; and on examination after death, the chest was invariably found to be filled with serum, the lungs to a great extent hepatized, and their motions entirely impeded by adhesion. They were usually discovered to be compressed, and their substance was often permeated by cysts. The coat of the animal was staring, and the body much wasted; but the mouth, gullet, and wind-pipe were generally healthy, though worms were occasionally found in the bronchial tubes—living when the animal was examined after death, though whether they had existed during life, or crept in after its decease, the inspector was unable to say. He inclined to the former opinion in consequence of the violent cough that sometimes oppressed the cattle; but the latter supposition is the more probable.

In Texas, one of the most splendid breeding countries in the world, the cattle are similarly affected; though probably in consequence of the greater heat of the climate the liver there is often diseased to a great extent, and cysts are found in it, as well as in the lungs and spleen, containing a thick yellow-looking fluid, but frequently also marks of "grit" or a calcareous substance. The disease there is much rarer than in other parts of the American Union, but, when it does break out, it is far more severe, and usually carries off its victims in a much shorter period of time. Still farther south, towards the Isthmus of Panama, the same results have been discerned. The animals there, when seized, are generally ill for only about a week. Violent groaning or "grunting" marks their sufferings. The pulse frequently rises to 90 or 100 in a minute, though in healthy cattle it rarely exceeds 60. The respiration unequally rapid—the beast sometimes breathing between 30 and 40 times in the same short space; and his heart, stomach, liver, kidneys, and intestines, as well as gullet and larynx, all bearing strong marks of inflammation.

It would be useless to multiply instances, as they all lend to confirm the late Report of the Victorian Commission, and it is not even hinted in America that the disease is contagious, or capable of being averted by inoculation. In fairness, however, to the veterinary surgeons of this colony, it is necessary to add, that they have impeached the accuracy of that report, and that they allege that at least it is premature; a sufficient length of time, they insist, not having elapsed to enable the infection to show itself, or the virus to circulate and establish its ground in the system. Several of these gentlemen give an able account of the disease, evidently based on close observation.

One of them, Mr. Graham Mitchell, says, "Pleuro-pneumonia generally indicates its approach by slight irritation of the air passages, giving rise to a dry husky cough, which may be heard for many months before death occurs, and is a timely warning to us, though generally overlooked; and until the animals affected forsake the herd, neglect their food, and seek the shade of the evergreen gum tree, their condition excites no attention. In milch cows, a sudden increase in the secretion of milk is often observed previous to its sudden suspension. On applying the ear to the side, a crackling sound is heard, mixed with the respiratory murmur, which it soon obscures, and no murmur can be heard. The crackling sound gives way to one of a puffing description, which is heard during inspiration. When the animal grunts or coughs, the sound is conveyed directly to the ear. On striking the side, a dull sound is heard, depending on the extent of the lung which has become solid, or the pressure or absence of fluid in the chest. If pneumonia predominates, the crackling sound is slightly if at all heard, and the dull sound on percussion is not so flat. If pleurisy predominates, the rubbing sound may be heard, and a depressed dullness on percussion, principally confined to the lower parts of the chest, owing to the pressure of the fluid. Farther on no sound whatever is heard on the diseased side, except a gurgling in the upper portion of the chest. The animal may appear heavy, breathing and pulse doubled, heaving flanks, skin dry, coat staring, encrusted tears form round the glaring, congested eyes, head held low and stretched out, occasionally groan and cough, saliva dribbles from the nostrils and mouth, with total suspension of rumination. The tail is cocked out back, more or less arched, with symptoms of stupor and disinclination to move. The animal lies down occasionally, and generally on the side affected; the skin of the nose dotted over with prominent drops of moisture; frequent desire to drink; partial or total loss of appetite. These symptoms are absent or present as the pleurisy or pneumonia is in excess; but any one accustomed to see the disease can tell at a glance by the general appearance presented by the animal, which may be termed a "*death-like*" sickness, the whole of the animal functions being more or less deranged (as beautifully shown by specimens now in my possession). Animals destroyed in the active stages present more or less solidification of the substance of the lungs (generally the left one), and small bronchial tubes, which generally commences at the lower portion of the lung, and gradually filling upwards, present shades from a salmon color to that of dark marble. The coverings of the lungs and ribs throw out thick bands of fibrin, which often fix the lungs firmly to the ribs, with more or less effusion into the cavity of the chest."

The preceding is not very distinct or grammatically correct writing, but it is exceedingly minute—often to a fanciful extent.

The following description of his *post-mortem* examinations is, on the whole, not less accurate, though the concluding sentence of it is doubtful. "The characteristic appearance," he says, "presented by the lungs of cattle in the early stages, is the appearance of scarlet patches or spots, which disappear on pressure; but as the disease advances, these patches become permanent, and more or less impervious to air when inflated. The patches may go on forming for months, according to the constitution and other predisposing causes to which the animal may be exposed, which determine the period of maturation. When the poison has accumulated, there is generally observed a slightly stimulating effect produced in all the organs of secretion. This runs on to irritation, and an amazingly rapid deposition of fibrin takes place, and mechanically obstructs, clogs up, and destroys the structure of the lungs, which present a peculiarly marble appearance, the cells, the cellular and interlobular spaces and small bronchial tubes being stuffed with a cheesy like fibrin of great density, and the air-cells presenting a reddish or darkish hue, from the imprisonment of the broken up red corpuscles or coloring matter of the blood, intermixed with white corpusculus and fibrin. The exudation of Pleuro-pneumonia never becomes organised, but the hepatized portion of the lung is sometimes separated or cut off from the healthy lung by a band of fibrin, or enclosed in a sack or cyst, which may remain dormant until the animal gets into condition. I therefore believe that Pleuro-pneumonia consists in the absorption of a specific animal poison into the blood, which may remain inactive from one to twelve months, ultimately deranging and destroying the vital functions, on the due performance of which the welfare of animal life depends."

"The late Professor Barlow," he adds, "of the Edinburgh Veterinary College, entertained the idea for a time that the disease had an animalcular or fungoid origin from its not being amenable to medical treatment; but after careful research, by the aid of powerful microscopes, he was satisfied that such is not the case. He microscopically examined all the secretions in different stages of the disease, and the only morbid change that could be observed was the dark color of the red corpuscles (from a deficiency of salts of iron and a superabundant of carbon) from their change of shape, and their being more or less burst or broken up. The development of these animal poisons is often illustrated as resembling the process of fermentation, which process brings about a complete change in the constituents of the fermented fluid, and which process we know can be delayed or hastened by the circumstances by which it is surrounded. He can supply substances that will at once stop that process."

He alludes here to inoculation; but prior to citing his remarks on that operation, those on the unhealthiness of the flesh of animals

suffering under Pleuro-pneumonia may be quoted with unalloyed satisfaction, as far more correct than those of the Victorian Commission. "It is impossible," he says, "to distinguish any change in the meat of animals that have suffered from the early stages; but the meat of those animals that have succumbed to the effects of the disease may be easily recognized by the pale or blueish tinge of the flesh, and from it being soft and flabby, never setting properly, and from dropsical effusion being readily recognizable, diffused through the flesh. The meat is therefore only got rid of in a manufactured form, and is never disposed of in joints. My opinion is, that so long as there is sufficient lung surface left to purify the blood, the flesh may be eaten with impunity. It has been proved that many poisons, such as that of snakes, which, when introduced into a wound, even in the minutest quantity, prove quickly fatal, may be taken into the stomach without producing any deleterious effect. This, with other well known facts, fully proves how completely substances received as aliment may be modified and their properties changed, or even reversed, by the powers of animal digestion. On the other hand, when a large portion of lung is destroyed or filled up, the blood cannot be purified, but becomes surcharged with poisonous gases. Few will doubt the unwholesomeness of meat taken from the carcass of animals that have arrived at the advanced stages, and that it will accelerate the formation of those diseases to which our systems individually are liable from hereditary or other causes."

Quoting seemingly from an English medical authority, he adds, "It has been proved beyond all doubt, that the practice of consuming in England the carcasses of diseased animals has increased to a fearful extent carbuncular and other diseases. Is it not therefore natural for us to suppose that the same result will be arrived at in this colony; that the climate and stimulating regimen as adopted here, from the cradle to the grave, will have a powerful influence in contracting the span of our existence, and hasten the progress of our degeneration, as depicted in the gas-pipe frames and hollow faces of our progeny? But what nature has denied art has supplied, in the shape of crinolines and pegtops, but sorry substitutes for the brawny muscle and iron-knit frames of the Anglo-Saxon race."

This gentleman's ideas on inoculation are founded on the opinion that Pleuro-pneumonia, instead of being a disease of the lungs, is an eruptive fever, and that the lungs and other organs become affected as local terminations after the subsidence of the fever. Nothing can be more unsupported than this conclusion. Still, he says "The local appearances are nature's efforts to relieve herself. When inoculation is effectually performed, a mild fever is produced, and where induration takes place, it is found to contain similar exudation to that which is contained in a diseased lung, which

cannot be produced by the virus of any other disease. The blood contains a darker tinge for several weeks after the operation. We know the great tendency which exists in cattle to throw out fibrin, which plays an important part in the healing of wounds by adhesion in those animals, more so in fact than in any other animal, *e. g.*, after the operation of spaying, puncturing, &c."

Proceeding on this basis, he goes on to state that he follows the system introduced by a Belgian physician in 1852, after inoculation had failed in Europe ; but, according to his assertion, as modified by this medical practitioner, "The operation became highly successful, though death by the operation occasionally took place. He recommended the virus being taken from an animal suffering in the early stages from a portion of the lung, where the disease was least advanced. Inoculation is followed, if the virus is properly inserted and is fresh, by slight induration and tenderness of the wound and its neighbourhood ; but if the virus is stale, sloughing and mortification are common consequences of the operation, and frequently a portion, and sometimes the whole of the tail is lost. In some instances, the sloughing extends to the perineum and adjoining organs, producing death after a period of much suffering. The local consequences of the operation last from two to twelve weeks. By vaccination the untoward results are avoided, thus removing the great objection that is justly held in reference to inoculation. All the secretions from diseased animals are impregnated with virus. I have found the saliva, synovia, pericardial effusion, urine, and the serum of the blood, which all produced (in certain stages) that peculiar induration peculiar to this disease. We therefore can see that the whole system and secretions are vitiated, all containing the germ of the disease, and capable of producing a powerful effect upon healthy animals."

The consequences which he admits to flow from this operation are so serious that few probably will be induced to try it ; still, in justice to him, the remarks he makes upon the mode of performing it, and the preliminary preparations requisite to be made, may be added. "Finding," he says, "the difficulty of procuring a sufficient supply of virus from the lung without a portion of the blood mixed with it, which soon causes putrefaction to set in, I tried and found the jelly-like effusion round the lung equally effective, and easily obtained without blood. I filter the effusion through animal charcoal and sand, evaporating in the sun to one half, and then preserve it by the addition of glycerine, which mixes well with the virus mechanically, giving it a consistence and adhesive power greatly assisting the action of absorption, with no other animal fluid could similarly effect. Where glycerine cannot be obtained, a strong syrup, made with crystallised sugar, will preserve the virus for a month or six weeks during cool weather, but is liable to ferment in warm weather, and will only do for a short time ;

but glycerine preserves it permanently. I have some of the lymph which has been two years preserved, and appears perfectly fresh ; but I never attempt to use, nor would I recommend it to be used after three months old, until sufficient time has elapsed for its being tested as to how long it retains its power. The effusion that I have found most certain was that taken between the eighth and tenth days after it had set in. Taken before that period it is deficient in its action, and after that period it is liable to produce violent effects."

The mode of performing the operation—by an incision at the extremity of the tail—has already been described ; and one inference which he draws from it is curious. "Many different opinions," he says, "are held as to how long diseases naturally or artificially produced retain their effects upon the system. I believe that many have a permanent effect. We know that certain diseases only once occur, one attack acting as a preventive to the recurrence. We have many instances as to how the system of females retain their impressions. We are able through generations to trace a stain of dark blood in the human subject, and I could instance many hereditary diseases which are handed down to posterity. We observe that, when a mare is once served by a jackass, her progeny show ever after unmistakable signs of the donkey ; and it is now believed by many medical men that the first impression made on a female in the first conception is conveyed to the progeny of the second husband. This is an important fact to bear in mind in reference to the breeding of horses and cattle, viz, the importance of having a good sire to commence with."

These extracts are singular, as showing the extraordinary latitude which researches in Pleuro-pneumonia in Australia may assume. But another veterinary surgeon of the colony, Mr. J. Wood Beilby, goes still further, by tracing a supposed analogy between fluke disease and Pleuro-pneumonia. "It is well known," he says, "that the fluke disease is most extensively prevalent among stock depasturing low and rich lands, which have been inundated during hot weather. In fact, it appears to require heated, as well as moist, pasturage to develop its existence. But even upland pasturages have proved occasionally subject to it in Victoria, especially such lands as are infested by the land-crabs, and therefore honeycombed under the surface with their reservoirs retaining water, and giving rise to moist exhalations during hot weather. Other uplands may also produce it ; for in England it is stated that 'the dry limed lands in Derbyshire will produce the rot as well as meadows retaining water.' In most localities in Victoria, nature appears to have supplied the aromatic herbage, peculiar to the healthy ridges intersecting the tracts of marshy country, to counteract the noxious and debilitating effects of con-

tinual depasturage of the herbal of swamps; but it is now very often observable that where runs, having within them both varieties of herbage, have previously proved pre-eminently healthy for stock, after such lands had been cut up into lots, and portioned among small stock-owners, the stock, subsequently kept upon the low-lying portions, have proved liable to various ailments, often of a fatal character, and are almost invariably subject to the flukes. Lands having a good fall, and laid dry by judicious efforts at drainage, if only by plough-furrows, may be quite cured of tendency to occasion the fluke, or its direful concomitants. Much good may also be effected by thickening the sward, by sowing grasses, and by preventing as far as possible depasturage by heavy stock in hot weather, whereby the surface becomes indented with foot marks, in which moisture stagnates, and thereby lends to the production of the disease. Sowing down parsley in quantities in pastures was recommended by the late eminent botanist, Miller, as a preventative. Other plants have been named as antidotes to the fluke, but their merits do not appear to have been proved so incontestible as parsley. It is probable that many of the bitter aromatic shrubs indigenous to many parts of Victoria might be cultivated for the purpose advantageously. It is so difficult to attempt any curative measures applicable to stock so much in a state of nature as our flocks and herds are, that the cultivation of herbal remedies appears to afford the only prospect of general success."

Considering Pleuro-pneumonia to be identical with hydrothorax, he adds, "The veterinarian, Gunther, mentions hydrothorax as a sequel upon rot, caused by the liver fluke, and his definition of the *post-mortem* appearances presented by cattle dying of the former disease, tallies precisely with the well known appearances presented by cattle said to have died of Pleuro-pneumonia. The cure for hydrothorax is simple and certain; and I can vouch for its success in every case I have used it. The remedy is carbonate of potash, in doses of half an ounce, twice a day, in half a pint of water or bran, for twelve to sixteen days consecutively; half dose for calves; weaker doses are insufficient."

This gentleman, however, is not an advocate—or at least a warm and indiscriminate one—of inoculation; nor does he appear, like most veterinary surgeons here, to be a believer in contagion. "Inoculation," he says, "has been recommended, as practised by German sheepowners, as a certain preventive of rot in sheep, and a French writer says that vaccine inoculation appears to give satisfactory results. Inoculation or vaccination of cattle can do no harm if proper matter be used, and applied by a careful operator; and it is well worthy of trial as an experiment, if not yet approved of for general adoption. But experience appears to

warrant the supposition that the stock depastured on lands subject to the fluke, ought not to be retained for breeding, but fattened off annually. As regards the contagious character of the real Pleuro-pneumonia, if that disease really exists in the colony, I can only say that my experience, with reference to the association of diseased cattle in close contact with others for at least many months, is that they manifest no appearance of having caught infection. In fact, our Pleuro-pneumonia has been an annual visitant to Western Point for at least five years past ; and the late season having tended to great and universal development of the fluke disease upon many more pastures than usual, owing to the heat of the spring months and early autumnal floods, the disease made unusual progress, and appears to have proved fatal alike by the usual emaciation caused by rict, pulmonary consumption, or, in cases of cattle in good condition and apparent previous health, by rapid attacks of acute inflammation of the lungs."

These Victorian writers do not exhibit in their language much elegance or perspicuity, but they are centuries in advance of recent cow-doctors in Old England, one of whom—Mr. Knowles, the worthy already quoted in a foot note, after recommending, says Mr. Youatt, "a strange mixture of tormentil rod, and bole armenian, and grains of paradise, and tumeric, and madder, and these to be given in oak-bark tea, for the cure of dysentery, says that 'red urine would be much better, or a pint of common brandy and a pint of water,' this being for a case of inflammation of so intense a character that the prescriber describes the beast as '*parting with his puddings!*'" The erudite practitioner however looks with evident contempt on many of his rivals ; for, after stating that, in cases of milk fever, "many are for giving clysters, and I have known them given in this complaint until the animal has been blown as full of wind as she could hold, which was the direct way to cure her, for the clysters and air must fill the bowels," he adds triumphantly, "*and yet some of these people call themselves cow-doctors!*"

Mr. Parkinson, another English writer on live stock, gives the following effective remedy for curing "foul of the foot." "My father's method," he says, "was to *cut up a sod where the diseased foot had trodden*, and either turn it over sward side downwards, or hang it on a hedge in that position. I am unable to account for this cure ; to me it is incomprehensible ; but in all the experiments I have tried, *this remedy, so simple and cheap, has proved the best*. The first year I was at Slane, we had many cattle troubled with this complaint ; I applied nothing else but what may be called a charm, but they all more readily recovered than when I used severer applications ; therefore I mean in future *never to have recourse to any remedy but the sod*." Mr. Nobbs, another equally accomplished English authority, writing of red-water,

says, "A dairy in my neighborhood was once removed from a farm on a flinty soil to one on a strong clay, and every one of them, consisting of seventeen, *were* affected. Three of them died, *though they had been charmed.*"

But remedies not less infallible exist in Scotland. Captain Henderson, in his "Survey of Caithness," says, "When the Highlanders find a beast troubled with red-water, they search either for *a trout or frog, and put it alive down the animal's throat*; while others give warm milk as a specific. In Inverness, cold water, poured down the throat, was formerly considered a sovereign remedy; or a decoction of nettles with a handful of salt."

Mr. Parkinson however the English author already quoted, has as much faith as Captain Henderson in the potency of the nettles, for the treatment of this complaint. "Take," he says, "two or three handfuls of stinging nettles, and boil or stew them slowly in three quarts of water until reduced to a quart; when cool, give it to the beast. Then having ready a pint of common salt, put it into a quart bottle *filled up with chamber lye*; shake it well until the salt be dissolved, and immediately give it to the beast. This remedy I believe to be infallible, and my success in this disorder has led me to many other discoveries. It is doubtful to me whether the nettles have anything to do with the cure, as I have known this disease cured with *butter-milk and pig's-dung*, and a frog with a large quantity of spring water; and I have known each of these remedies to fail; the former prescription never!" Many such remedies are to be found in a standard English work by Mr. Clater, entitled, "Every Man his own Cow-doctor."

But the French in these matters are equally profound. In the celebrated district of La Vendee, when a cow died of milk or puerperal fever, the veterinarian of the place declared she had been killed by bleeding, and that there were *hedgehogs* which were the cause of her complaint, and that these ought to have been *taken away from her*. If a cow is calf pastured, he expressed his opinion, *before the sun had risen*, on any herb *over which a hedgehog had passed*, she would have a parcel of little hedgehogs in her womb with her calf; and in the full conviction of this truth, he was in the habit of introducing his hands into the uterus of a cow and tearing off the cotyledons found there, under the supposition that they were small hedgehogs.

In the midst of all this credulity and barbarism, it is satisfactory to state that a respectable Dutch farmer at the Cape of Good Hope has proposed a remedy for Pleuro-pneumonia, which may be useful, and certainly can do no injury. "Take," he says, "two table-spoonfuls of aloes, two of turpentine, and the same quantity of sulphur; let the whole be mixed together in a quart of milk: using judgment as to its repetition." This, he declares, has at the Cape proved most efficient; the only drawback to his assertion

being the addition of his opinion that the disease is contagious and inoculation a preventive.

It would be vain to multiply instances, or adduce prescriptions from "squatters" and other anonymous persons all over the country. The only principles that should be attended to in the treatment of Pleuro-pneumonia are those which regulate the great laws of health ; and the only means of modifying or finally extirpating it, are attention to breeding and rearing the animal.

On the old Latin principle that "*similia similibus geruntur*," or "like are produced by like," care must be taken that the animal from which the stock is raised shall be vigorous and healthy. In Africa, in the instance of the horse, attention is generally paid to the blood and condition of the mare ; but in Europe, in that of the ox, the male is almost exclusively held in view : and it was by attending to this principle in the rearing of sheep that the celebrated Mr. Bakewell obtained such celebrity for his new Leicester breed.

Setting out from the earliest period of life, therefore, care should be taken that the animals from which the stock are raised should not be too young. In cattle, as in the human race, undue youth produces no vigor. Children descended from boys or girls of fourteen or fifteen years of age are usually a stunted race alike in body and in mind ; and calves, the issue of heifers and of bulls one year old, or thereabouts, are usually equally feeble. As full grown maturity in man is found in highest perfection from twenty-five to thirty years of age, so far as physical condition is concerned, and in woman, from eighteen to twenty-five, so it may be laid down as a general rule that no bull should be employed until he has attained from two and a half to three years of age, nor any heifer until two, or two and a half.

The breeder will also be regulated by circumstances in the choice of the animals he rears. If he is a grazier, and raising them for the market, he will choose those which fatten soonest and are most in demand. Should he be a dairyman, he will select animals that give the greatest quantity of milk, and of the best quality for producing either butter or cheese. If he be a farmer, he will prefer those that are best adapted to the soil and particular circumstances of his land. In every condition, each of them will do well to avoid the fatal error of unduly breeding in and in, which in the end has been found no less pernicious to animals than to man ; and in the instance of the Leicester sheep, so soon led to their deterioration. But on the other hand, like the celebrated breeder who raised that race, he will take care to retain the services of the male sufficiently long to impart its good points to the whole of his herd ; and at the end of from two to three years, according to their number, exchange the animal for some other entirely unconnected with them in affinity, and having, if

possible, some new point in which his own was defective. The same observation of course applies, but in a more limited degree, to cows, as the influence of the female, in the rearing of cattle, is not usually kept sufficiently in view. In all cases, it will generally be found most advantageous to segregate the bull, and to keep him in a stall ; or in a field separate from the herd.

The cow is with foetus usually for nine months. No certainty of impregnation however can be discerned till the end of the second month, when in placing the ear to the side of the animal, the beating of the heart of the young one—generally double that of the mother—will be heard. During this period, little alteration of treatment is necessary so far as the cow is concerned, except that she could not be either inadequately fed on the one hand, inasmuch as she has her own existence to support as well as that of another, nor too luxuriantly nourished on the other, as abortion is thus apt to follow. If previously with milk, and in good condition, she may have that fluid withdrawn from her for the purposes of the dairy till about a fortnight before parturition ; the more especially if, as is generally the case, it has been for a short time before secreted in unusual quantities, to provide for her expected offspring : but, if the animal be poor, milking should cease at least two months previously. Some increase of food should at same time be given ; but if any febrile symptoms be thus produced, it must be discontinued, and a slight purgative be given. Bleeding should not be resorted to, unless in the instance of animals previously in high condition.

Cows however are especially subject to abortion or “slinking,” and when once this has occurred, the animal is not only exceedingly liable to it again, but also to affect others to such an extent that in some districts the casualty frequently assumes all the appearance of an epidemic, as if it arose from atmospheric causes. But it is in reality produced mainly by the high sensitiveness of the animal ; the placenta, which usually follows the foetus some days afterwards, being either putrid or giving out such an offensive smell that all the cows in the neighborhood become subject to a similar misfortune. M. Creuzel, a French veterinarian, records an instance in which every animal on a particular farm had been thus affected for at least thirty years, and the result was only got rid of by destroying the building and introducing an entire change of stock.

The symptoms of approaching abortion are very obscure. If the animal however be carefully watched, she will generally, prior to its occurrence, be observed to be dull and languid. The appetite is diminished, or ceases altogether ; her power of rumination is suspended, and her milk either dries up or greatly falls off in quantity. She staggers in her walk, and either reposes longer than usual, or, when she gets up, remains in a motionless position.

Her belly, at same time, diminishes in size ; and, on placing the ear to the side, the motion of the foetus will be no longer heard. It is dead by this time, and shrinking in dimension previous to expulsion—which usually indicates its approach by the discharge of a yellow or red fluid from the vagina of the mother. The latter meanwhile begins to moan, and her breathing becomes convulsed and labored ; her pulse is feeble, wiry, and interrupted. If proceeding from violent blows, all these symptoms are aggravated in a high degree, and rupture of the uterus is apt to follow. In the usual course, the foetus is discharged within a day or two, and abortion is apt to take place during the seventh or eighth month of pregnancy.

The remedies for preventing abortion consists in bleeding, if the approaching symptoms be severe, and in purging if they are not. The animal should be at the same time removed from wet ground and from too luxuriant pasturage. It should be carefully sequestered by itself, at a distance from all the other pregnant females in the herd ; and some veterinarians, Mr. Youatt especially, remark—the foetus and placenta should be carefully and deeply buried at a distance, far beyond their reach of smell or observation ; inasmuch as, they maintain, the animals are highly “imaginative,” and are thus affected by fright to drop their incipient offspring too. If the cow, after slinking, be unusually weak, what veterinarians term “comfortable drink,” must be given her ; in the event of any febrile symptoms however being present, such potations will be highly noxious. Should the foetus linger in the wound and exhibit marks of putrefaction—as will be indicated by the discharge from the vagina of the mother assuming a foetid odor—it must be got rid of, either by additionally purging and bleeding the animal, or by the administration of ergot of rye ; and the cow, so soon as recovered, fattened and sold to the butcher, as she will be ever afterwards subject to the recurrence of abortion, if again impregnated.

Towards the end of the ninth month, if the course of nature proceeds regularly, the approaching confinement of the cow will be indicated by the rapid enlargement of the udder, in consequence of increasing secretion of the milk, and a drooping of the belly, from the pressure of the womb. The animal will appear restless and uneasy, evince difficulty in respiration, and may occasionally moan. A glairy fluid will be at the same time observed to trickle from the orifice of the vagina, her tail begins to be elevated, and she is constantly getting up and down. As in this case parturition is not distant, she should be brought home and housed, lest, if bad weather come on, she should suffer from the possible effects of some days' exposure ; but further than securing her comfort and repose, the result should be left to natural agency, and her delivery will soon ensue, if the presentation of the foetus has been

regular—that is to say, if the fore feet, followed by the head of the young animal, first present themselves on rupture of the water-bag in which it has been hitherto contained. The animal should then have a pint of warm ale administered to it in an equal quantity of gruel, and be left to its repose

But frequently the pains of labor are protracted, and the presentation is irregular. In the former case, a quarter of an ounce of the ergot of rye should be administered in half a pint of ale, and repeated every hour until delivery ensue. In the other, mechanical assistance is requisite, and it should be applied at the end of twelve hours, if the delivery be longer protracted. In this case, it may be suspected that the presentation is irregular, and the irregularity may assume every aspect; but it generally consists in the head being presented first, and it may be obviated generally with ease by passing the hand into the orifice, and slipping a cord round the feet of the foetus, by means of which it is readily withdrawn, by the application of a slight force on the next effort of the mother to give birth to her offspring. The arm of the veterinarian, while performing this operation, may frequently be denumbed by the pressure of the contracting orifice; but it will be better to endure this than to have to perform the operation of destroying the foetus, or removing it by the almost indefensible Cæsarian operation, and compromising the life of the mother, either of which alternatives will generally be found necessary, should any other irregularity of presentation occur. The former of these operations is accomplished by means of a curved knife, introduced in the palm of the hand, and disjuncting the foetus, the body or head of which will generally easily be protruded on detaching the hind or fore quarters; but if need be, a cord must be attached to either, and the remains gently removed by force. The latter—the Cæsarian operation—consisting of cutting through the exterior of the mother, should never be attempted except by a skilled veterinary surgeon; and it has been so seldom successful that it is doubtful whether it ought to be performed even by him. In case however deformity of the pelvis should exist to such an extent as to leave no other means for the extrication of the foetus, the cow should be thrown on its left side, and after it has been properly secured, an incision made six or eight inches long, about two inches before and a little below the haunch bone, and the intestines having been carefully placed aside, another of the same extent made into the substance of the womb, from which the foetus may then easily be removed. The orifice is then to be sowed up, and the wound treated in the usual manner; but only one case is on record of the operation having proved successful.

Sometimes it happens that the womb itself becomes ruptured in the course of delivery, or the foetus may be discharged with

such force that the former may become inversed. In the first of these events, the sides of the orifice must be sewn up, and in the other it must be replaced. The latter, though seemingly the most simple, is generally the more difficult operation of the two, in consequence of the violent efforts made by nature to prevent it. In either case the animal must be freely bled—in the first named instance, to prevent inflammation, in the other to subdue the resisting power of the animal. Mash, gruel, purging, and low diet are of course necessary after both, until all febrile symptoms have subsided, when sedatives may be administered, and more substantial food gradually substituted. Occasionally it may happen that the bladder too is protruded; and though it may be replaced, the animal generally continues such a wretched object for life, in consequence of the violence thus done, that the sooner it is slaughtered on recovery the better.

When the animal has been delivered, or delivered herself in the usual way, she should be left alone with her calf to lubricate it with her tongue, and eat the after-birth or placenta. Sometimes there may be a little difficulty in detaching this; and the homely plan of suspending six or eight ounces from it by a cord is not to be despised. When all has been successfully accomplished, a warm mash and some gruel, with water from which the chill has been withdrawn, should be placed within her reach; and a pound of Epsom salts, with two drachms of ginger administered within two hours, to prevent any chance of febrile irritation. Bleeding is rarely necessary, inasmuch as blood is apt to flow from the womb. Should this take place to an unusual extent, and what is termed "flooding" ensue, cold applications of ice and water, or of a pound of nitre dissolved in a gallon, should be made to the loins, and the animal allowed to drink of cold water to any extent she chooses. Two drachms of opium every second hour may also be administered, if the case be serious.

But puerperal, or milk fever, frequently ensues, and it is the most dangerous affection which the cow in such circumstances has to encounter. At first the inflammation is merely local, but soon it extends to the system, and involves so rapidly every intestinal organ, that the farmer is often ignorant of its existence, until it has reached its second stage of debility, and paralyzed the hind quarters of the animal to such an extent, that it has received the designation of "dropping after calving," a malady which the breeder dreads above all others. Should it have been earlier discerned, bleeding must be resorted to; and, if the wiry and accelerated state of the pulse indicates that fever still lingers in the system to an inflammatory degree, the beast must still be bled till the state of its circulation is reduced. Afterwards purges may be given, followed by the usual aromatics and tonics when all inflammation is subdued, as will be evinced by the

return of the milk—by the animal's ceasing to groan and paw the ground with her feet—to grate her teeth and foam at the mouth—to toss her head and attempt to butt, as she generally does in the first violent paroxysms of the disease.

Cows in high condition, it has been observed, are most subject to puerperal fever, and it is more frequently on their second or third deliveries than the first, as the animal having rarely attained its full growth in the former instance, the additional nutriment goes to increase its bulk, instead of inducing disease. If the constipation is obstinate recourse must be had to clysters; and, should paralysis of the hind quarters be threatened, the animal must be slung. When she returns to pasture, she should, in the first instance, be placed on ground of short bite; and much of the danger of milk fever may be averted if this precaution be adopted also a short time before her confinement.

Frequently, however, the inflammation after parturition is local, and assumes the appearance of irritation of the teats. Trifling as this affection—"sore teats"—may seem, it is not to be disregarded, as, if the animal thus retains her milk, in consequence of the pain which sucking of the calf or application of the hand engenders, inflammation of a constitutional order may follow, or she may become a confirmed kicker for life. It may induce too, the more serious malady of garget, or inflammation of the udder, and terminate in violent suppuration which may endanger the life of the animal, or, finally, it may assume a pustular appearance around the parts, and give rise to that cow-pox, by reasoning inductively on which, and the exemption which absorption of its matter secured to those who accidentally received it in chaps on their hands, from the previously terrific scourge of small-pox, enabled Jenner to make his immortal discovery of vaccination.

The first of these affections is to be treated by fomenting the parts with warm water, in which a small quantity of the sugar of lead may be dissolved. The teats may be subsequently rubbed with an ointment composed of a quarter of an ounce of this substance, a drachm of alum powder, an ounce of yellow wax, and three ounces of lard. In the second, general bleeding may be necessary if the inflammation is violent, and hydriodate of potash administered to the extent of ten or twelve grains a day, internally, as well as applied externally in the proportion of one part of it to seven of lard. A milder unguent, composed of an ounce of camphor, the same quantity of mercurial ointment, and half a pound of elder ointment, may be used after each milking, and washed off prior to each subsequent one, when the inflammation is subdued, or it may be tried in the first instance before recourse is made to the powerful absorbent iodine. It will also be a useful application in the third disease, after Goulard's lotion has been

used, though the former will generally be found efficient in allaying the irritation of the irruption, and a dilute solution of chloride of lime successful in removing the offensive effluvium. It is seldom that the constitutional irritation produced by cow-pox renders general bleeding necessary, though this should be resorted to if the state of the pulse indicates inflammation.

With respect to the treatment of the calf, in ordinary circumstances the more the young animal is left with its mother for the first few days in general the better. The lubrication of it affords her an agreeable employment, and stimulates the system of the offspring. The peculiar milk, besides, which the cow for that short period secretes after parturition, possesses an aperient power which is highly useful in promoting the discharge of the dark-colored fæces which had been long accumulating in the intestines of the fœtus. This milk therefore, known by the name of "beastings," ought to be by no means thrown away.

The "navel-ill" is usually the first malady to which the calf is subject. Sometimes the navel-cord, from happening to have been improperly cut, is subject to bleeding, which is easily remedied by applying a fresh ligature; but more frequently the parts become inflamed, and indicate the formation of matter in the vicinity. This must be opened with a lancet so soon as observed, and the irritation on other occasions allayed by fomentation, as well as the administration, twice or thrice, of two-ounce doses of castor oil, as an emulsion, by means of an egg. When debility ensues, gentian and laudanum, with a small quantity of port wine, will be useful in arresting an affection so serious that butchers hesitate to purchase an animal until the time for the occurrence or danger has passed.

Constipation is a very frequent disease to which young calves are subject. Sometimes, as already explained, it arises from the absence of the *beastings*, but on other occasions it may be from the young animal having overgorged itself with milk, as it is apt to do if allowed to remain constantly with its mother in the shed. In this case, it must be withdrawn from her, and tied in a corner of the shed, and prevented from sucking more than thrice a day. In the former instance—and in both if constipation exist—castor oil may be administered as before, or the same quantity (two ounces) of Epsom salts, dissolved in hot water, poured down its throat by means of a horn.

Diarrhœa, on the other hand, is a much more common as well as dangerous disease in calves, and may be produced by over-luxuriant food, though more frequently it is the result of inadequate food. In either case, it must be treated with promptitude—first, by the administration of a mild purgative, such as two ounces of castor oil, or three of Epsom salts, followed by astringents and alkaline medicines, to which carminatives should after-

wards be added, as mentioned when describing the complaint in the instance of the adult. The mixture named, "Calves' Cordial," may here be given, though it contains the latter medicines, perhaps, in too high a degree. It must, therefore, be accompanied with starch or thick gruel, bran mash, with a little peas-meal or bean-flour.

Calves are also exceedingly liable to hoose, which sometimes assumes the aspect of an epidemic among them, and carries off great numbers. It is to be treated as in the adult, though bleeding must be resorted to with more caution; and it should be kept in view, that doses of medicine for the calf, till at least the first month of its existence is past, should rarely exceed one-eighth of what is given to the adult.

Towards the approach of its sixth week, the calf should be castrated. This operation is usually performed by the farmer himself, in the old-fashioned way of attaching a ligature to the scrotum, and allowing it to remain till, in the course of a few days, the whole drops away; but a much more scientific, and well as infinitely less cruel mode, is to make two small incisions in the bag through which the testicles will drop, and then detaching them, after having first tied the blood-vessels. The animal should be in good condition at the time the operation is performed; and if any marks of inflammation follow, it must be subdued by a slight bleeding, and the administration of purgatives.

The future treatment of the calf must be regulated by the same principles as that of the adult; keeping it in recollection, in both cases, that whenever the animal is housed, much good may be done, and many diseases averted, by attending to its due comfort, in the shape of litter; and, above all, by maintaining efficient ventilation.

There are two or three affections to which calves as well as cattle are occasionally liable, but which cannot properly be classed under the name of diseases. The first is, a difficulty of purging them; the second is, occasional vomiting; and the third is, rabies, or the result of a bite from a mad dog. The former of these affections is to be treated by diminishing the doses of purgative medicines, and doubling or trebling those of the aromatic or stimulant. The second affection—vomiting—which is rare, is to be subdued by bleeding, and the administration of purgatives. The third requires both in a higher degree, and the animal frequently becomes so ferocious that it is necessary to shoot him. No attempt should be made on these occasions to consume the flesh as food, though it is not poisonous to the stomach; notwithstanding that the saliva of the animal, if introduced into a wound on the hand, or any other part of the human body, will give rise to the disease just as readily as a bite directly from the rabid dog itself.

Rheumatism is an affection to which cattle are infinitely more subject, especially after calving. It generally arises from exposure to cold and damp, and if the animal has accidentally been seized by the pains of labor in the field and compelled to maintain her position there for many days, it will to a certainty arise. In its incipient state, when stiffness of the joints only prevails, accompanied with tenderness of the loins, it is termed by the farmer "chine-fellow;" when the joints are farther affected by swelling, and all the constitutional symptoms are aggravated, it receives the name of "joint-fellow." Either of these is a troublesome disease, and the last may become highly dangerous, terminating, as in the human subject, in rheumatic fever, and being as in that instance too, often difficult of cure. It may be relieved by palliatives, but scarcely ever removed. Embrocations, consisting of hartshorn and turpentine, may be used; and the tincture of cantharides may occasionally be added. Recourse may be had to blistering and the actual cautery itself; and bleeding must be resorted to freely if constitutional irritation exists. The great means, however in the instance of rheumatism, is to take measures to avert it, by attending to the condition of the cow-house and the comfort of the animal; for, if cattle once become its permanent victims, the sooner they are slaughtered the better.

"Foul in the foot," as it is lengthily and erroneously termed, is a disease to which both calves and adult cattle are liable. It may arise either from the introduction of foreign bodies, such as stones, &c., between the claws; or it may be produced by over-driving the animal; and, finally, it may make its appearance spontaneously, or without any apparent cause; though in the last named instance, this will generally be found only in low marshy ground, where the hoof has been injured by long humidity. Frequently it is accompanied by so much inflammation as to lead to suppuration and great constitutional irritability as well as suffering, inasmuch as the animal can with difficulty keep its feet for the purpose of feeding, but is obliged to remain recumbent on the grass. When it occurs, or lameness is observed, the foot should be in the first instance carefully examined, and any extraneous substance removed. Poultices should next be applied, and an opening made with the lancet so soon as matter is formed. Constitutional remedies may be necessary, in the shape of bleeding and purgatives, if the irritation assumes an extensive form; but the main remedy or preventive, if the ox be employed in working, consists in shoeing the animal.

"Frog in the foot" is an affection to which cattle are not subject, though a fungus sometimes emerges from an ulcer in the heel considerably resembling it. It discharges a matter of a brown unhealthy hue, and is productive of much lameness. It is to be

treated by the application of linseed poultices in the first instance, and afterwards by lotions of the chloride of lime or a strong solution of alum. All these diseases, in the instance of milch cows, have generally an important effect in diminishing the secretion of milk.

Calves, as well as young cattle, are often the favorites of lice, which settle upon them in myriads unless arrested by the application of an ointment consisting of one part of mercurial ointment and five of lard. Warbles also and the gad-fly establish on their bodies their chosen seat, if the larvæ be not destroyed by the introduction of some corrosive liquor. Warts, too, frequently annoy the animal by appearing around the teats or the eyes, unless destroyed by nitrate of silver, or, if large, removed by the knife, followed by the actual cautery, to stop the bleeding and prevent recurrences. But many of these affections are instances of bad management and neglect on the part of the stock-owner.

So much has been said on the subject of breeding that in a work of this description it may be desirable to make a brief allusion to the various breeds of cattle; inasmuch as, if published, it may be advantageous to render it in some degree a manual for the stock-owner, and especially to mention those animals which are best fitted for introduction into this climate, in consequence of their comparative exemption from disease, and also of the profitable qualities they present. British cattle will alone be alluded to, as it is almost exclusively from Britain that animals are here imported; and, without entering into details concerning their varieties, the description will be mainly confined to the four divisions—long-horned, middle-horned, short-horned, and polled beasts.

The long-horned shall be mentioned first, as presenting the most striking contrast with the last; but the middle-horns are considered by many to be the more ancient breed, and to be the true representative of the primitive ox. They spring from Craven, a small district in the West Riding of Yorkshire, adjoining the neighboring counties of Lancashire and Westmoreland; and are supposed to have Irish origin. They are valuable in consequence of the large quantity and good quality of the milk they yield, and of their readiness to fatten; but are sometime objectionable in consequence of the length of their horns—varying from two feet to three and a half in size—which occasionally assume such a form or configuration and direction as to interfere with their feeding and repose; that is to say, when they unduly project in front, or assume a dependant position from the head of the animal. They were, however, greatly improved and modified in this point by the celebrated English breeder, Mr. Bakewell, who, last century, acquired such a reputation for introducing the new Leicester race of sheep. Smallness of bone and beauty of form, with tendency to fatten, and a rapidity in becoming

so, were the main points to be kept in view ; and he eminently succeeded in his object, though the race, like his sheep, have materially degenerated since his death. For the grazier's purposes, they undoubtedly rank high, as they yield a large proportion of flesh from a small consumption of food ; but their milking qualities diminish in proportion, and they are unfit for working purposes or as beasts of draught. They have consequently now, to a large extent, been superseded by the Teeswater, an animal with shorter horns from the banks of the Tees.

The middle-sized horn is supposed to have been the original ox, as he existed in the days of Abraham, who possessed cattle, and possibly in the days of Adam too, inasmuch as he probably was alive in those of his descendant Jubal, mentioned in Scripture as "the father of those who dwelt in tents and were the owners of herds." This animal seemingly was the earliest of British cattle, and a concise account of it is given by Cæsar. It is found in its greatest perfection in Devonshire, the western county of England ; and is remarkable for its docility, its inclination and aptitude for work, as well as its disposition to fatten, though it yields a milk more rich than abundant. It possesses great width and depth of girth in the region of the heart and lungs, with corresponding broadness of loins and roundness of flank—the chief points to be attended to in the configuration of an animal, in addition to clear, bright, and prominent eyes, a forehead small and flat, nostrils open and high, thick neck, hair curled about the head, and skin of medium thickness, covered with fine and soft hair, but not adhering to the body so lightly, especially about the haunches, as to interfere with fattening. The favorite color of a Devonshire middle-horn is a deep or blood red ; when he is yellow, it is supposed to indicate a tendency to diarrhœa ; and if intermixed with white patches, he is rejected by the farmers as a mongrel or inferior breed. He is unrivalled at the plough, can trot along with a light waggon at the rate of six miles an hour ; and is improved in his condition by working, if not employed before the end of his second year, nor beyond that of his fifth or sixth. He is however somewhat too flat-sided and narrow-humped ; though unusually free from disease, and what is an important consideration for this colony, he is rarely attacked by affections of the respiratory organs.

But the short-horned are, on the whole, the favorite breed of British cattle, in consequence of their splendid appearance, their beautiful and richly variegated colors, and their union to a remarkable degree of a capacity for fattening with a power for giving milk. They spring chiefly from the counties of Durham and York, and all the most celebrated animals of recent times are the descendants of a bull named "Hubback," or a cow termed "Lady." The celebrated "Durham Ox," which attained the

enormous size of 216 stone weight, and for which £2000 were refused, belonged to this breed; and "Lady" herself, when fourteen years old, sold for 206 guineas, while her daughter, "Countess" in her ninth year brought 400. Their milk-yielding powers are not inferior; four gallons night and morning being habitually yielded by them, while a farmer in America swore that he obtained twenty pounds of butter a week from a single short-horn. They, besides, work well, and are improved by moderate employment. The quality of their flesh is remarkably good, and they fatten so rapidly as to be fit for the butcher at the end of two years.

The polled race of cattle, however, are now rapidly disputing dominion with the short; and, though not so attractive in appearance, being generally black, they possess such an union of qualities usually deemed incompatible, that they may gain the ascendancy. Destitute of horns, they can never become dangerous in attack; and they are hardy in an eminent degree. While they give milk in abundance, they fatten readily, and the flesh is laid on so very regularly in layers with the fat that its appearance is beautiful, and taste, as well as its nutritious qualities, are not inferior. Galloway, in Scotland, is the native seat of this breed; but it has been perpetuated with great success in the county of Forfar by a Mr. Watson, of Keillor, who obtained many prizes from the Highland Society of that country, and from Smithfield also, the celebrated market of London, for the size, the excellent and high qualities of his breed. The only objection to the Galloway race is that it is said to be prone to red-water, and that its young are apt to be attacked with quarter-evil. They moreover are not improved by crossing with any other breed, and are apt to degenerate if removed from their own cold region to a more genial climate.

Such are the leading races of the British oxen. Ireland is distinguished for the excellence of its breed, and Africa or the Cape, for the extraordinary intelligence of its cattle, which, especially among the Hottentots, acquire a degree of sagacity not inferior to that of the horse—animals seeming there to rise in intelligence in proportion as men are observed to sink. Asia, too, the cradle of the human and possibly of all created race, has its infinite varieties; but it would be superfluous to introduce them here.

